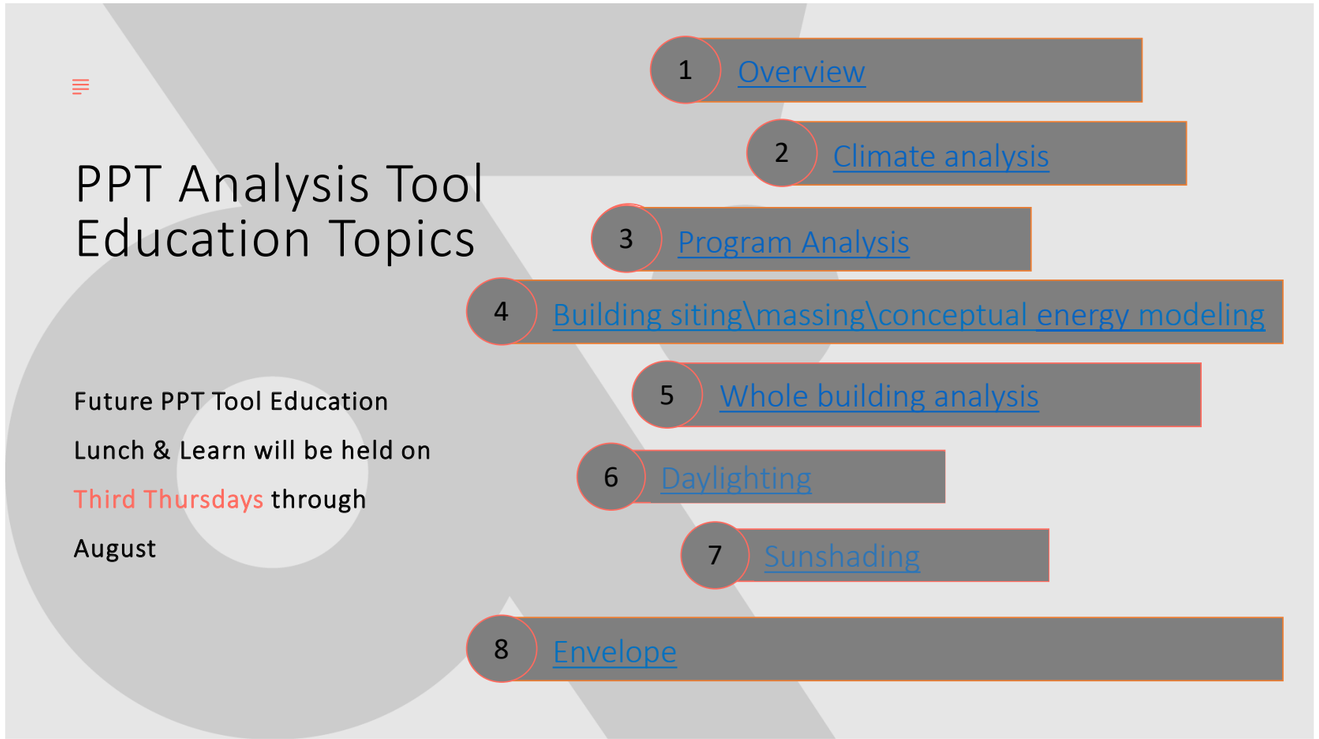
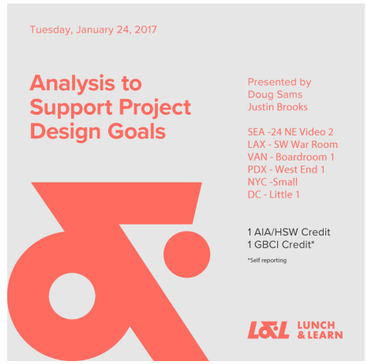
2017-2018 LUNCH AND LEARN LAUNCH

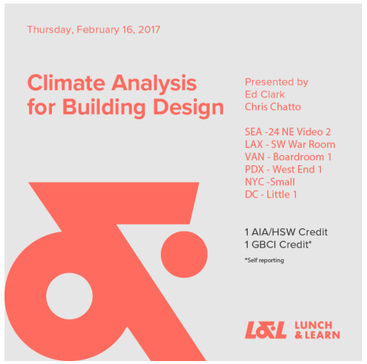
HIGH DESIGN HIGH PERFORMANCE

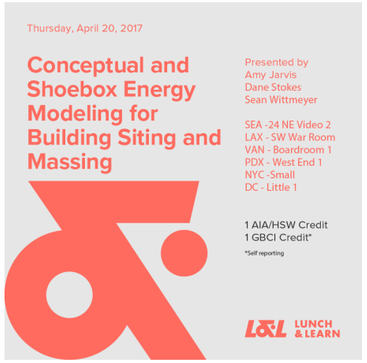
INSPIRING OUR WAY TO BETTER BUILDINGS

LUNCH AND LEARN
2017 SERIES









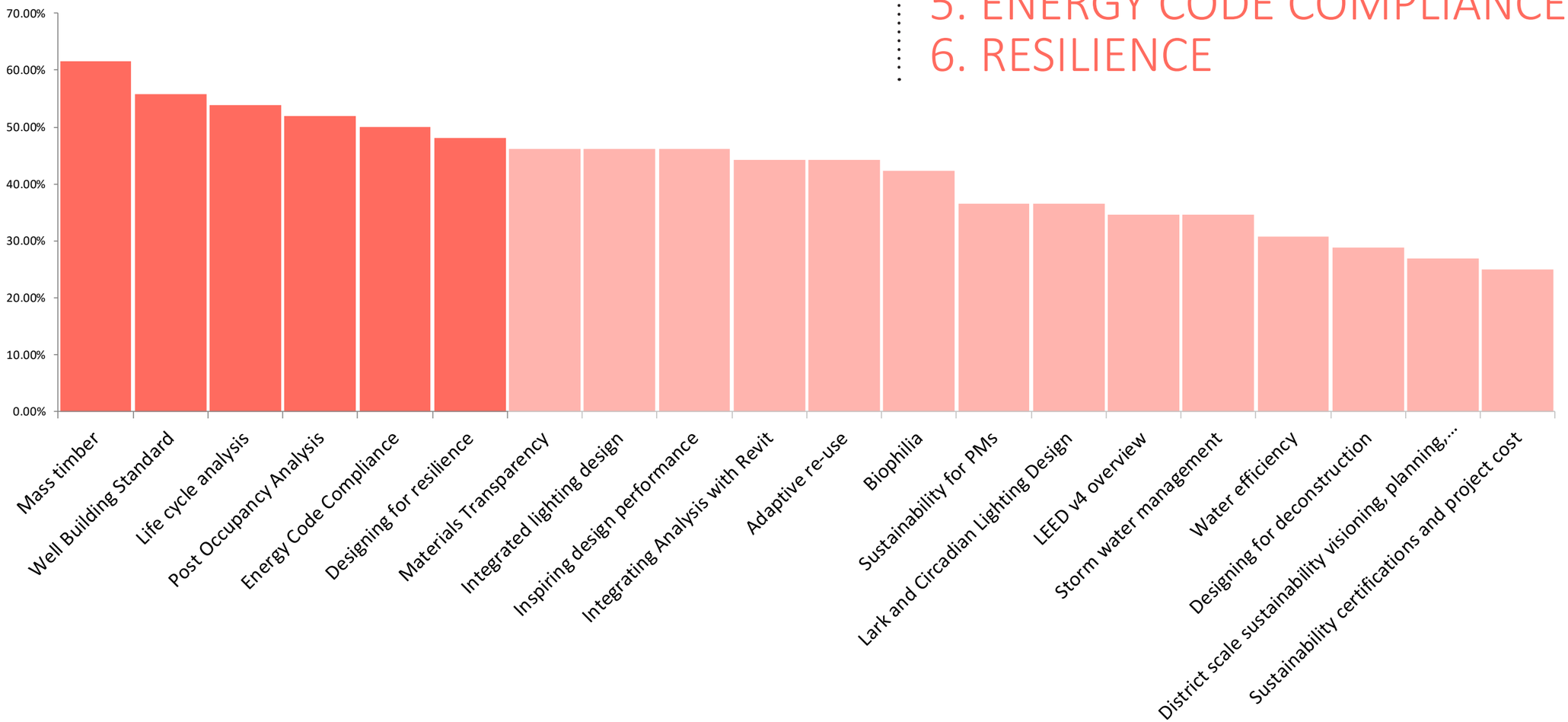
8 TOPICS 15 PRESENTERS

LUNCH AND LEARN
SURVEY RESULTS

jacob.dunn@zgf.com

TOP 6 - TOPICS

1. MASS TIMBER
2. WELL BUILDING STANDARD
3. LIFE CYCLE ANALYSIS
4. POST OCCUPANCY ANALYSIS
5. ENERGY CODE COMPLIANCE
6. RESILIENCE



TARGETED LNLs

target audience

PMs

PAs

Princ.

1
Inspirational

- get inspired
- ask the right ?'s
- application-based

2
Technical

- upgrade tech skills
- detailed cases
- software disc.

Tech

Des.

PPT

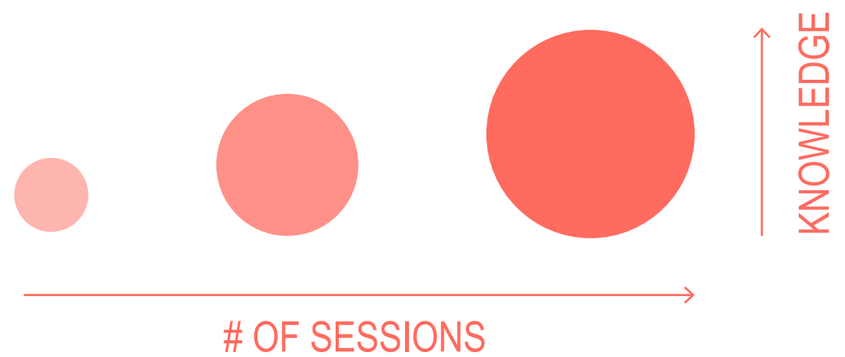
ALL STAFF

target audience

LUNCH AND LEARN
APPROACH

MASS TIMBER
WELL BUILDING STANDARD
LIFE CYCLE ANALYSIS
POST OCCUPANCY ANALYSIS
ENERGY CODE COMPLIANCE
RESILIENCE
COMPUTATIONAL DESIGN

GRADUATED APPROACH



INSPIRE EDUCATE

INSPIRE EDUCATE

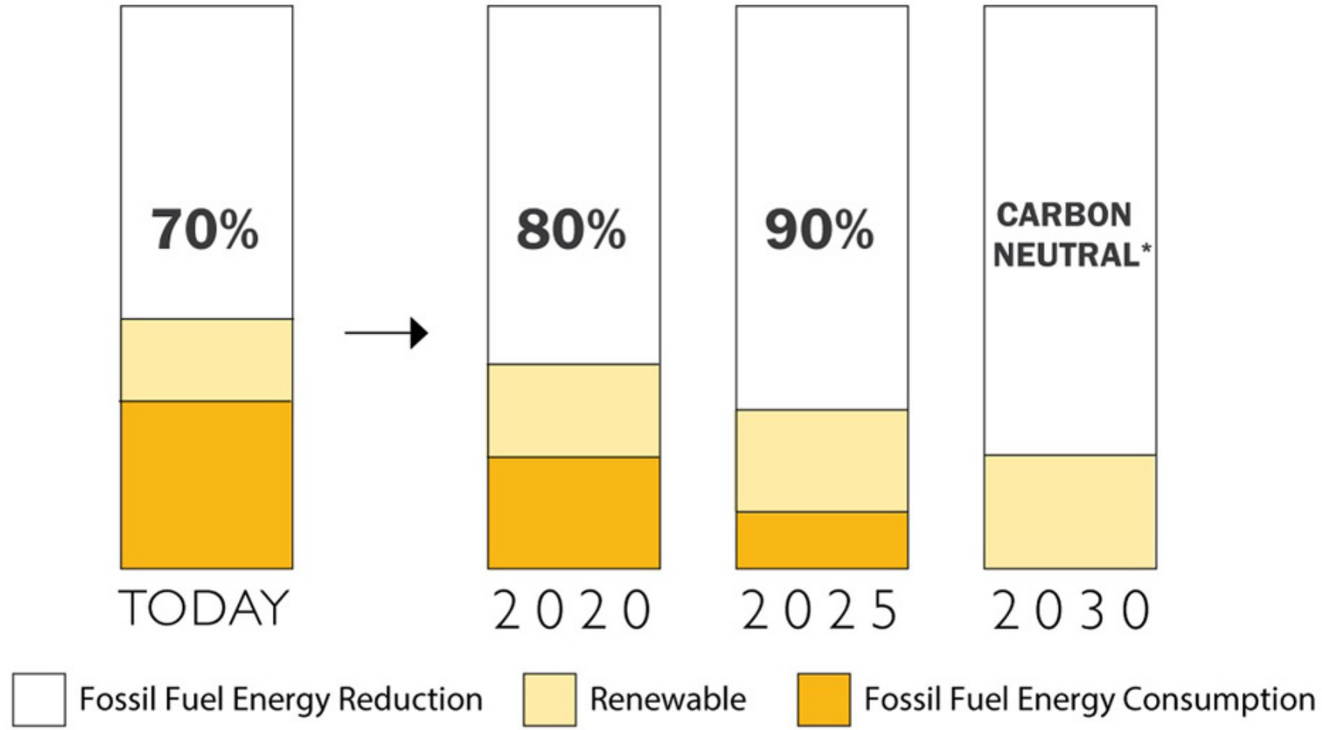
ATTITUDES

EXAMPLES

“If you want to build a ship, don’t drum up people to collect wood and don’t assign them tasks and work, but rather teach them to long for the endless immensity of the sea.”

Antoine
de Saint-Exupery

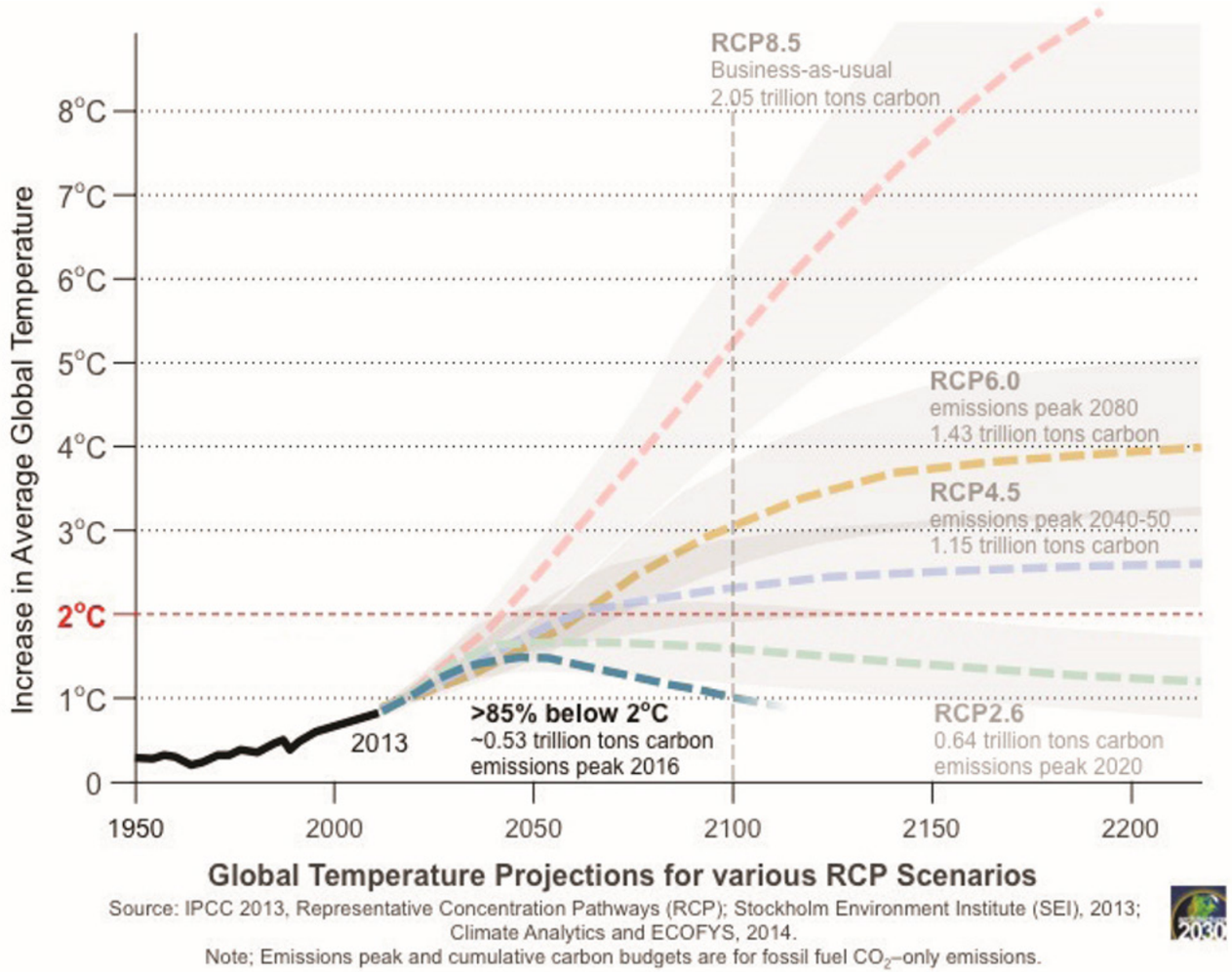
QUANTIFICATION
ARCHITECTURE 2030 CHALLENGE



The 2030 Challenge

**Using no fossil fuel GHG-emitting energy to operate.*

QUANTIFICATION
ARCHITECTURE 2030 CHALLENGE



http://architecture2030.org/files/roadmap_web.

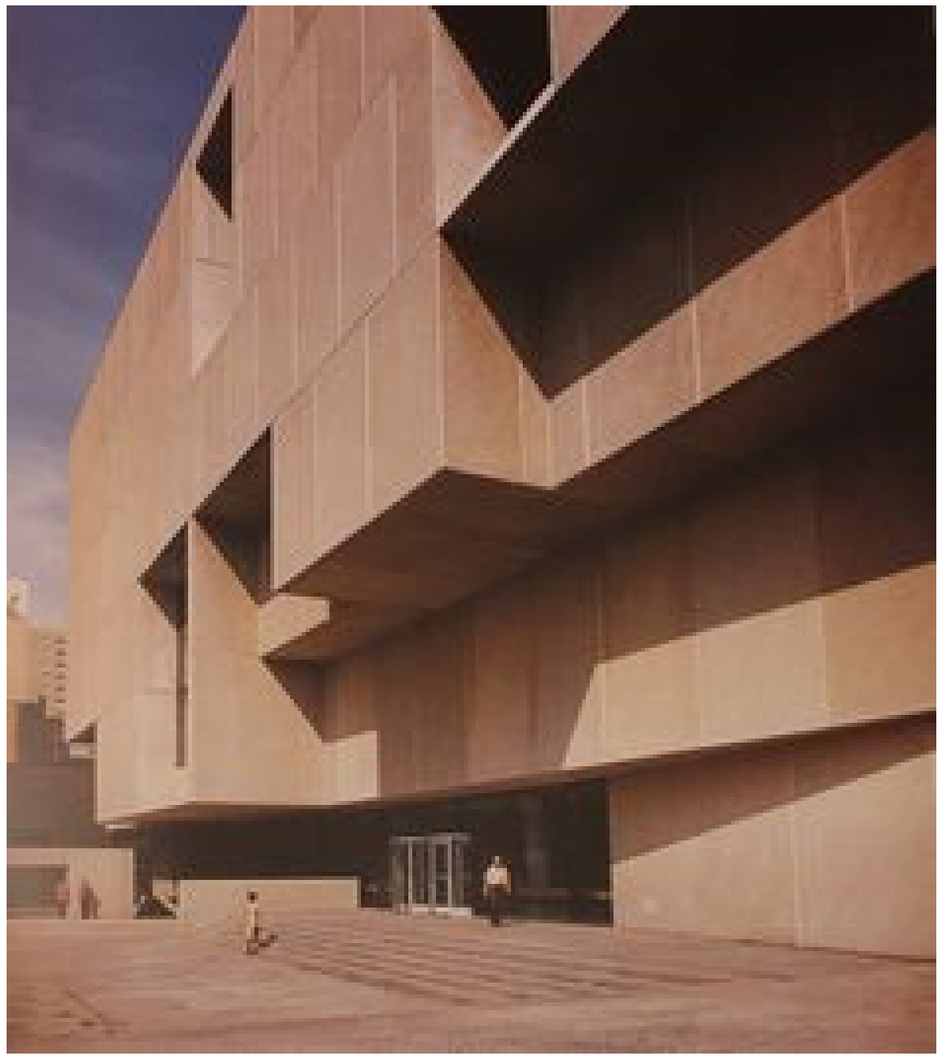
QUALIFICATION

REDEFINING OUR RELATIONSHIP TO THE NATURAL ENVIRONMENT

“People will not fight for what they do not love.”

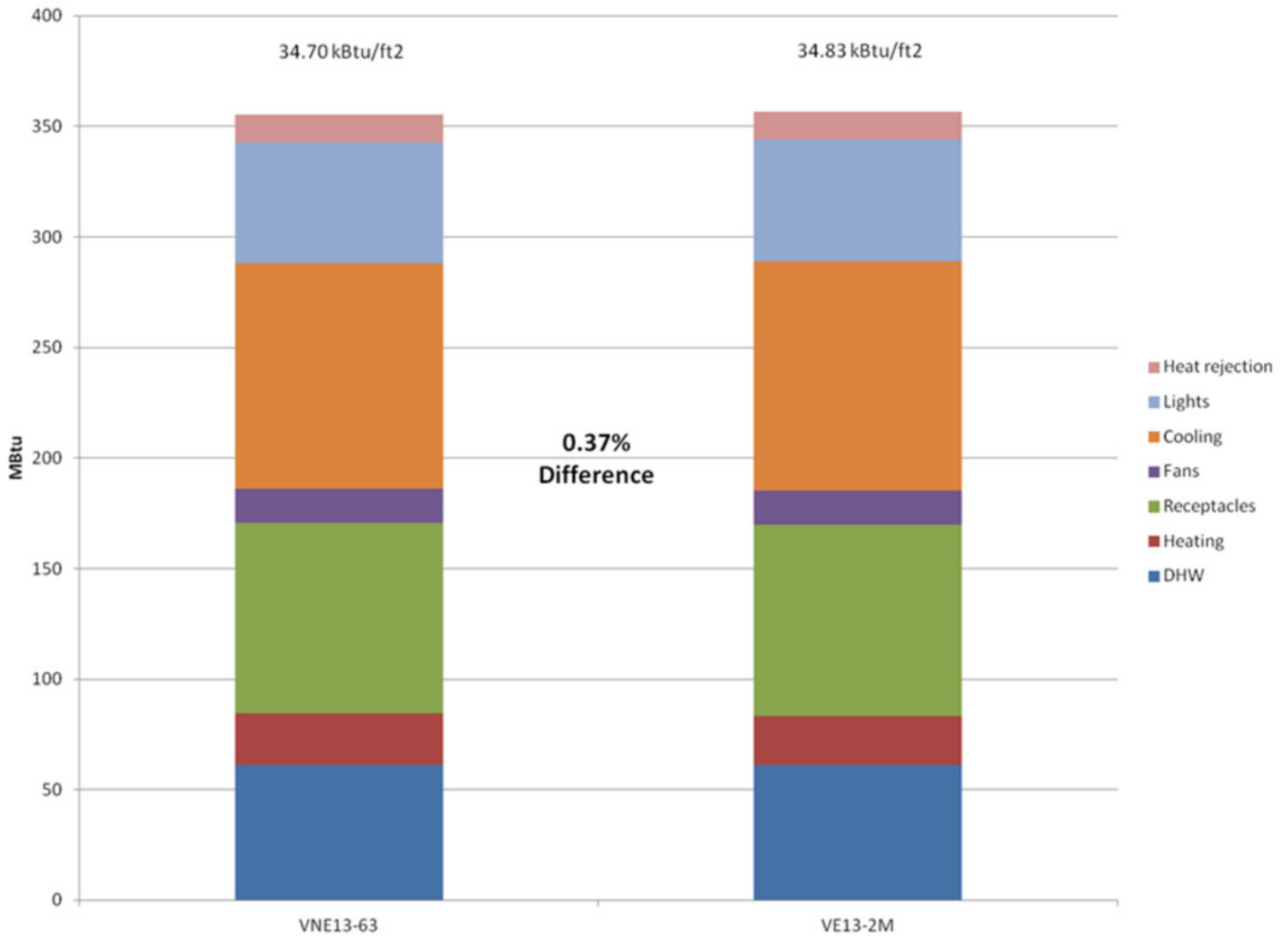
David Orr

DESIGN MATTERS
BECAUSE VITALITY MATTERS

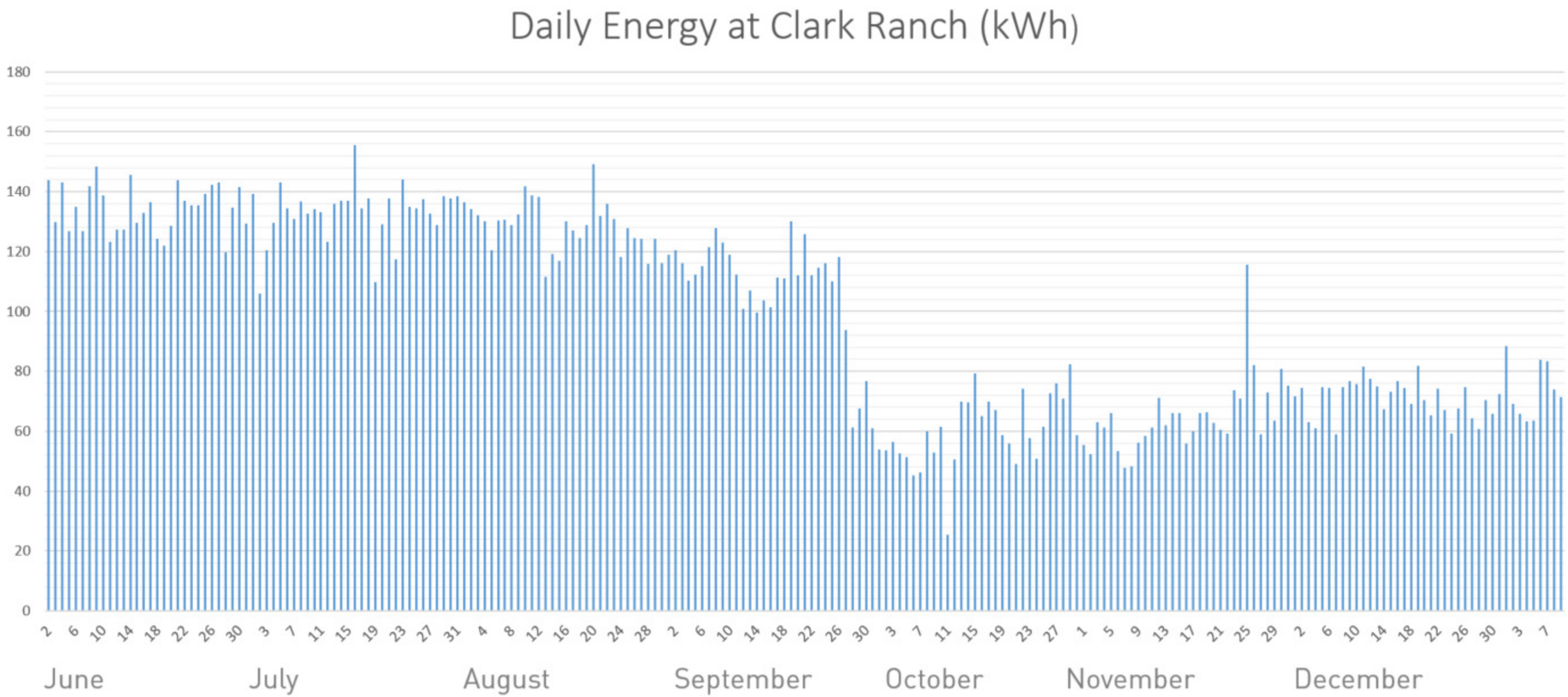


Marcel Breuer - Atlanta Fulton County Central Library

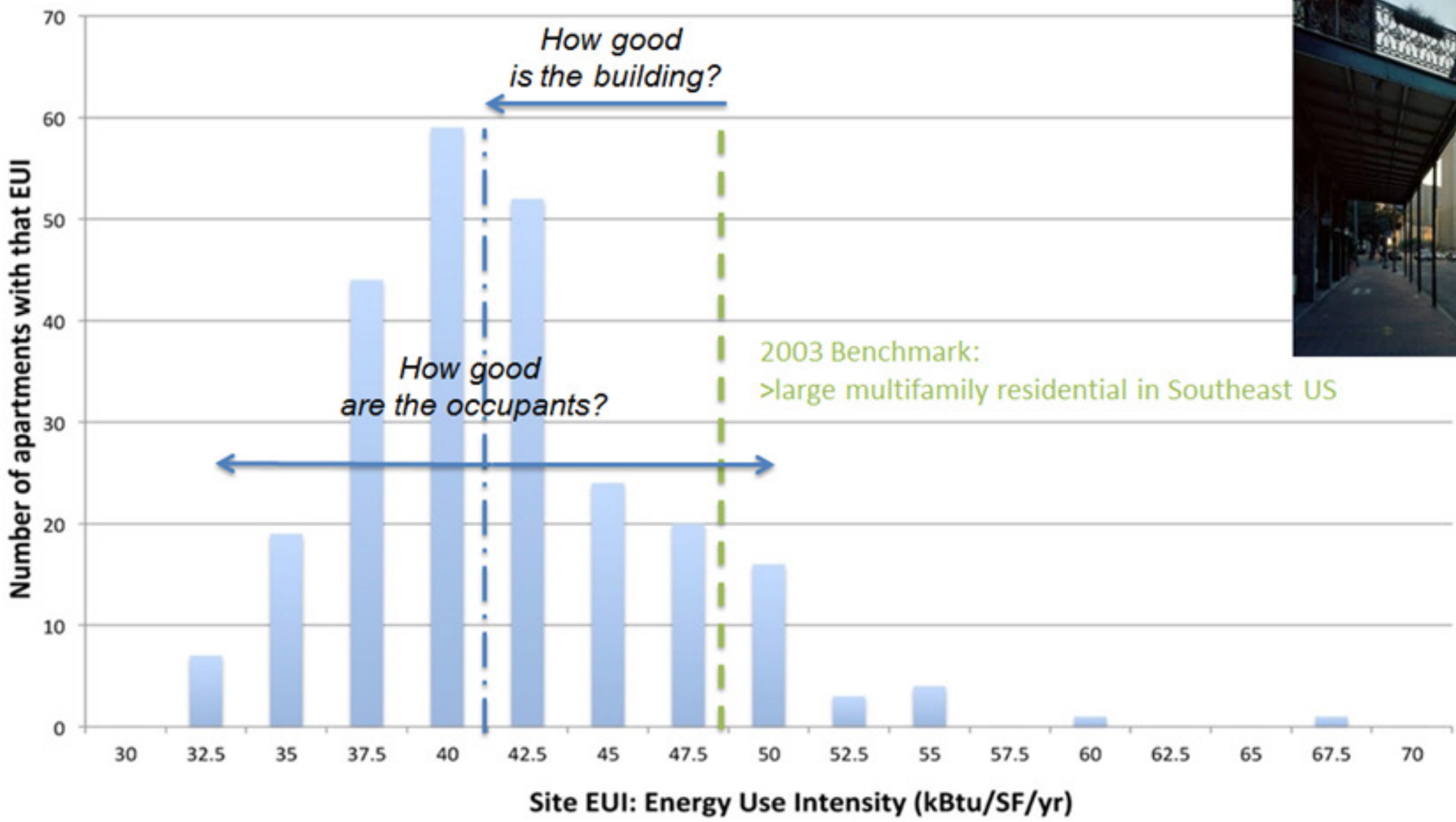
PEDAGOGY MATTERS
ENGAGING THE OCCUPANT



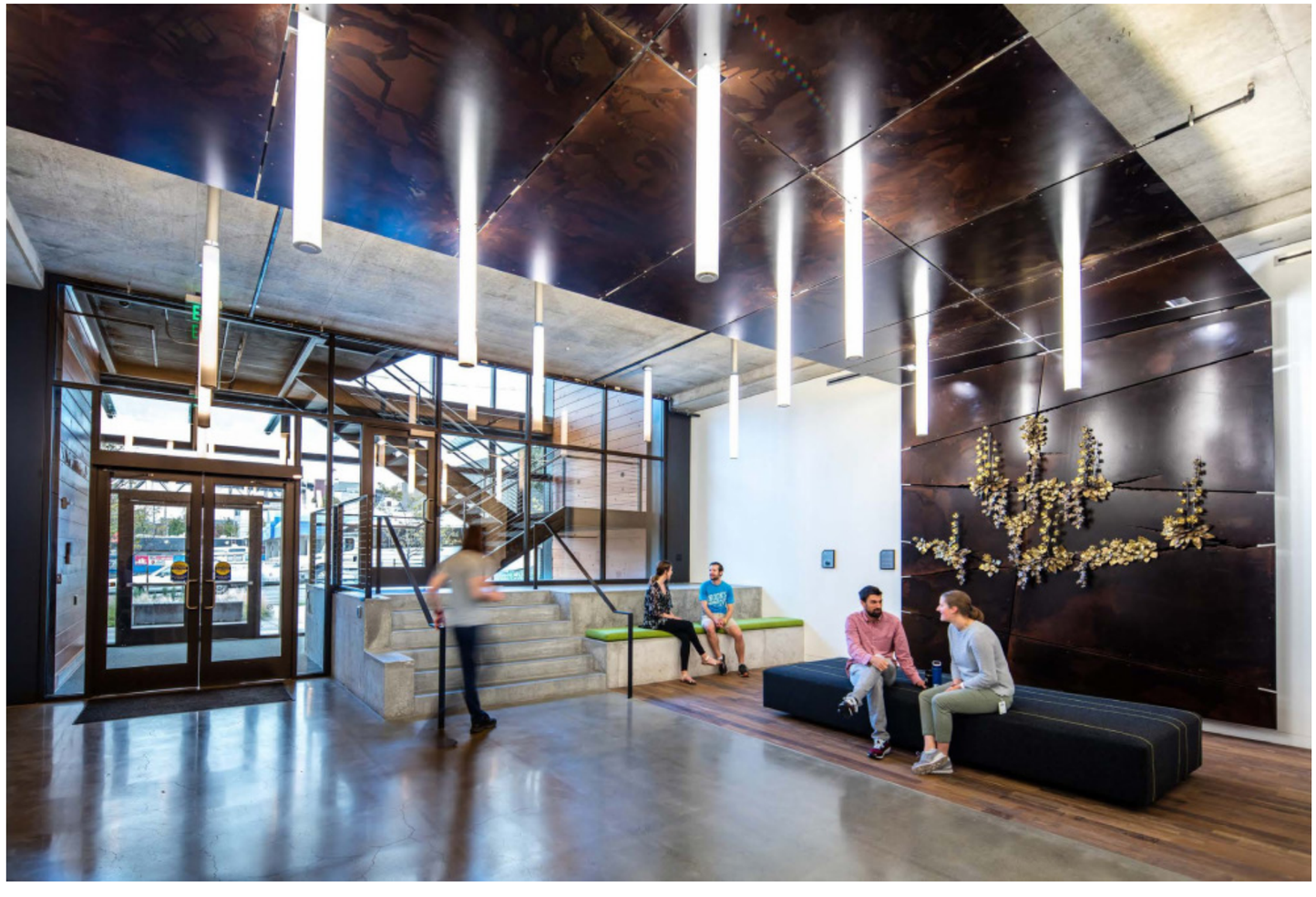
PEDAGOGY MATTERS
ENGAGING THE OCCUPANT



PEDAGOGY MATTERS
ENGAGING THE OCCUPANT



PEDAGOGY MATTERS
ENGAGING THE OCCUPANT



LMN Architects - Stone24 Mixed Use Development

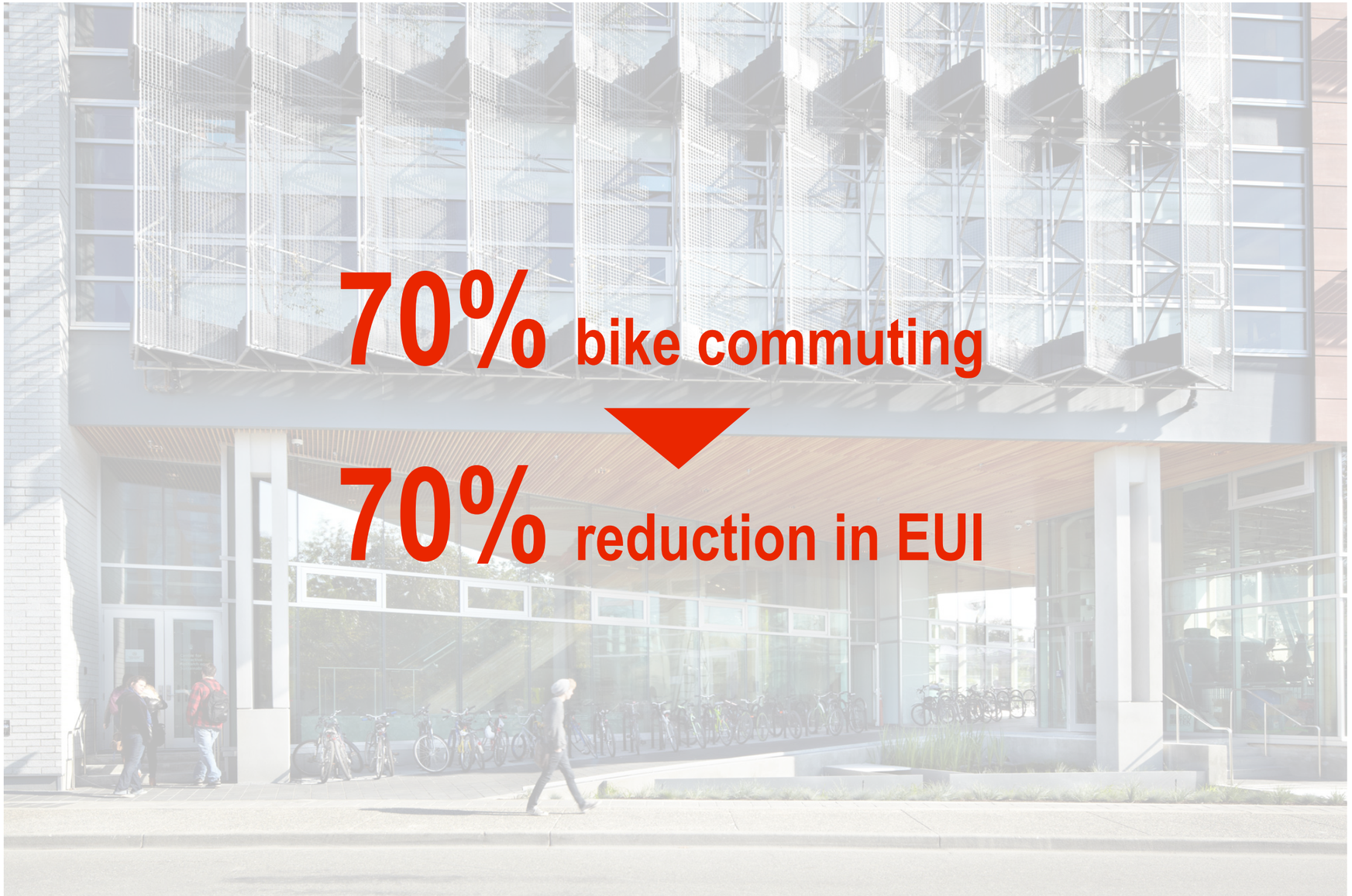
PEDAGOGY MATTERS
ENGAGING THE OCCUPANT

Perkins + Will - Center for Interactive Research on Sustainability

PEDAGOGY MATTERS
ENGAGING THE OCCUPANT

Perkins + Will - Center for Interactive Research on Sustainability

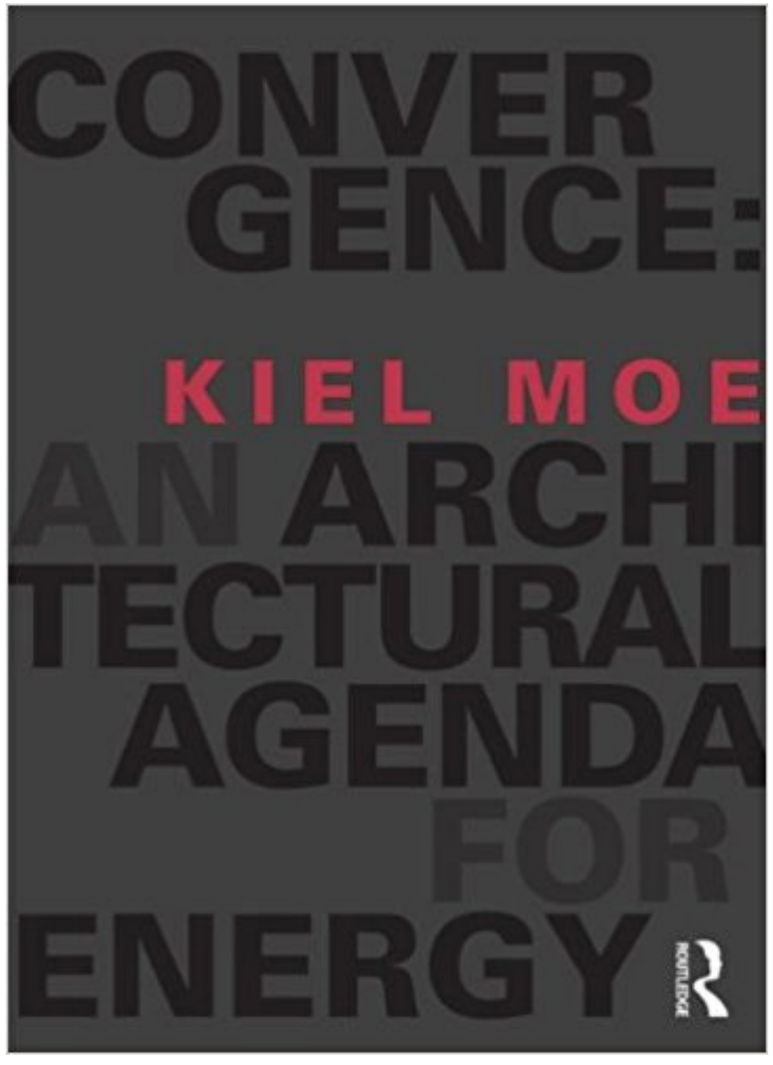
PEDAGOGY MATTERS
ENGAGING THE OCCUPANT



Perkins + Will - Center for Interactive Research on Sustainability

http://edrpl.us/blog/2016/12/21/about-those-bike-racks

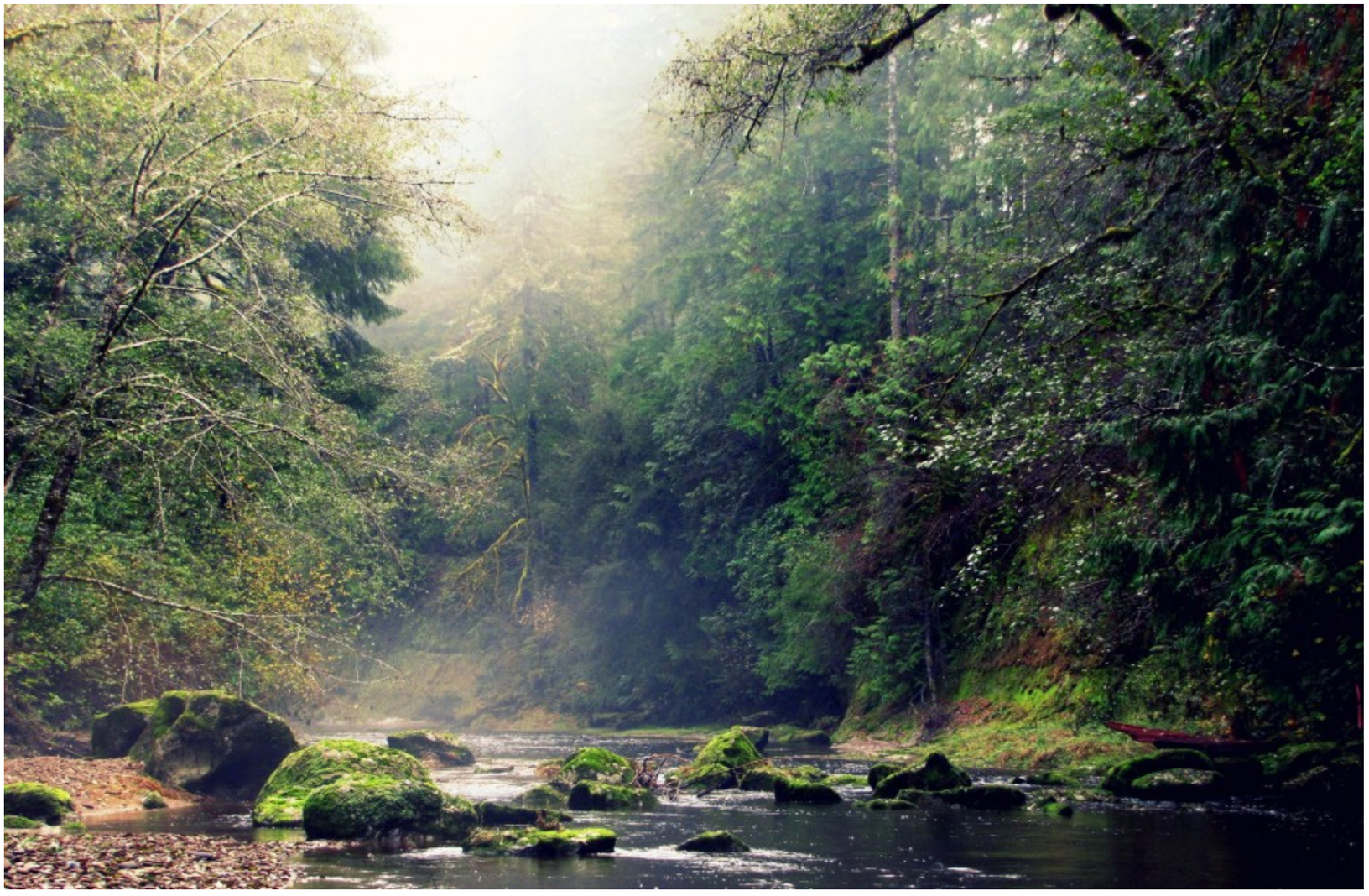
ATTITUDES
AN ARCHITECTURAL AGENDA FOR ENERGY



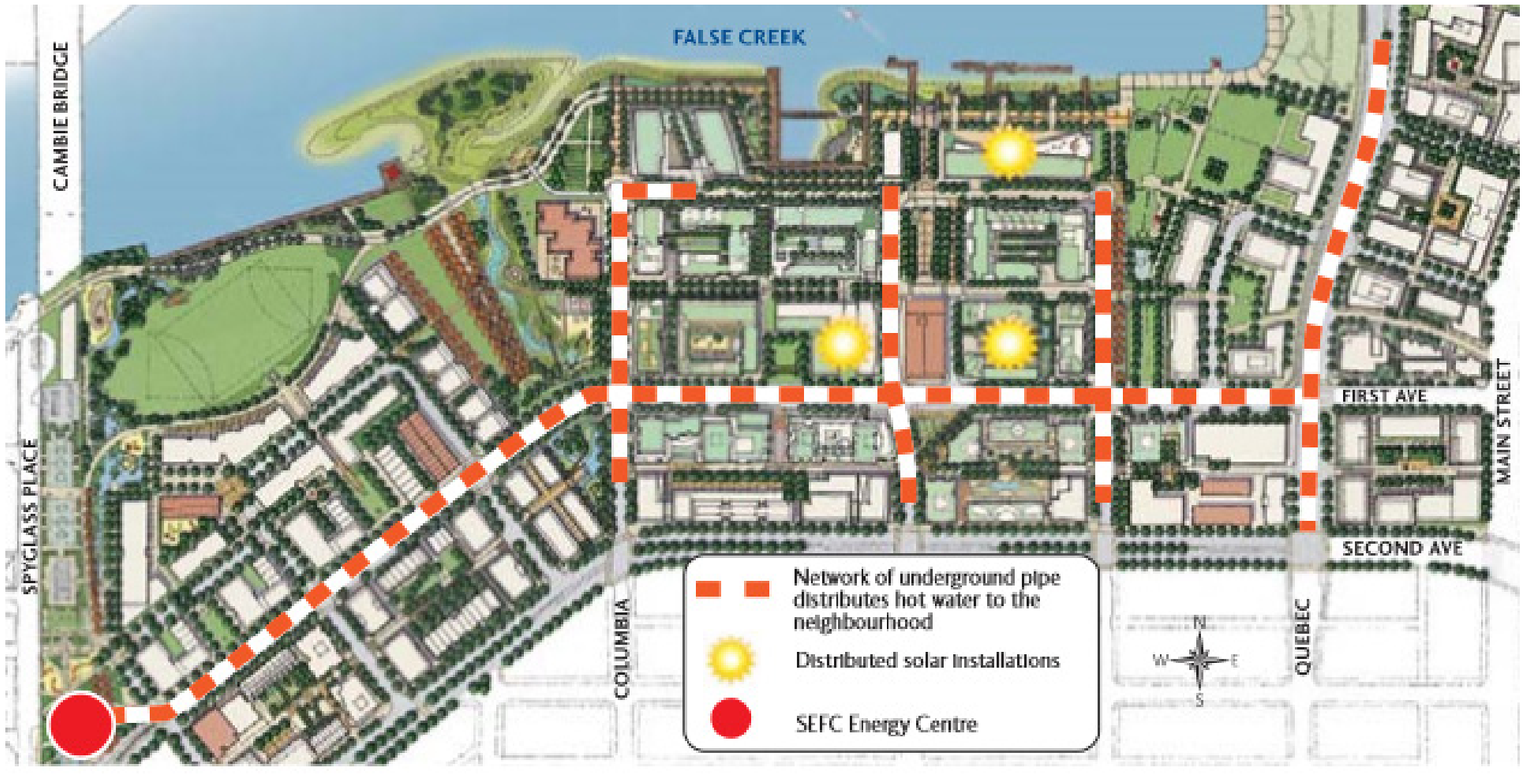
ATTITUDES TOWARD ENERGY
EFFICIENCY?

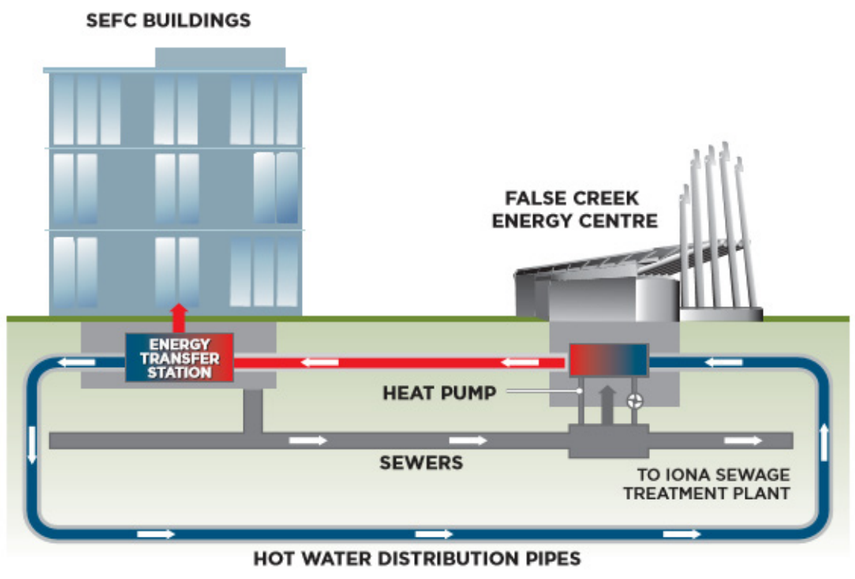
ATTITUDES TOWARD ENERGY

MAXIMIZATION - LOW ENERGY, HIGH OUTPUT



ATTITUDES TOWARD ENERGY
MAXIMIZATION



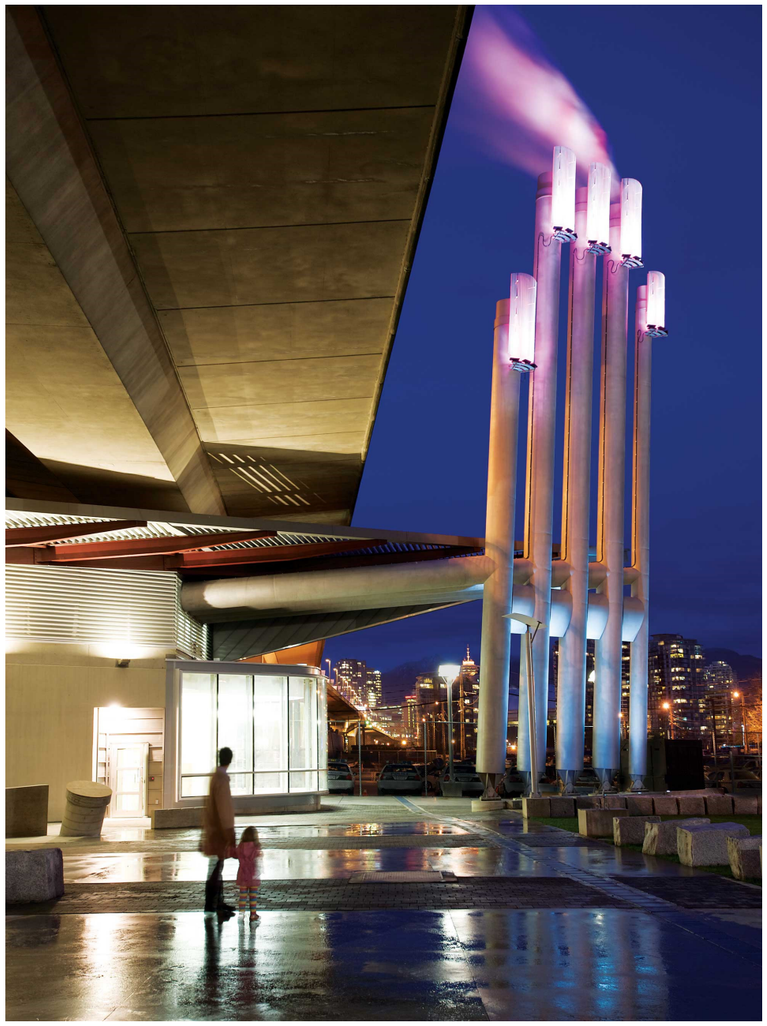


False Creek Energy Centre - Vancouver, BC

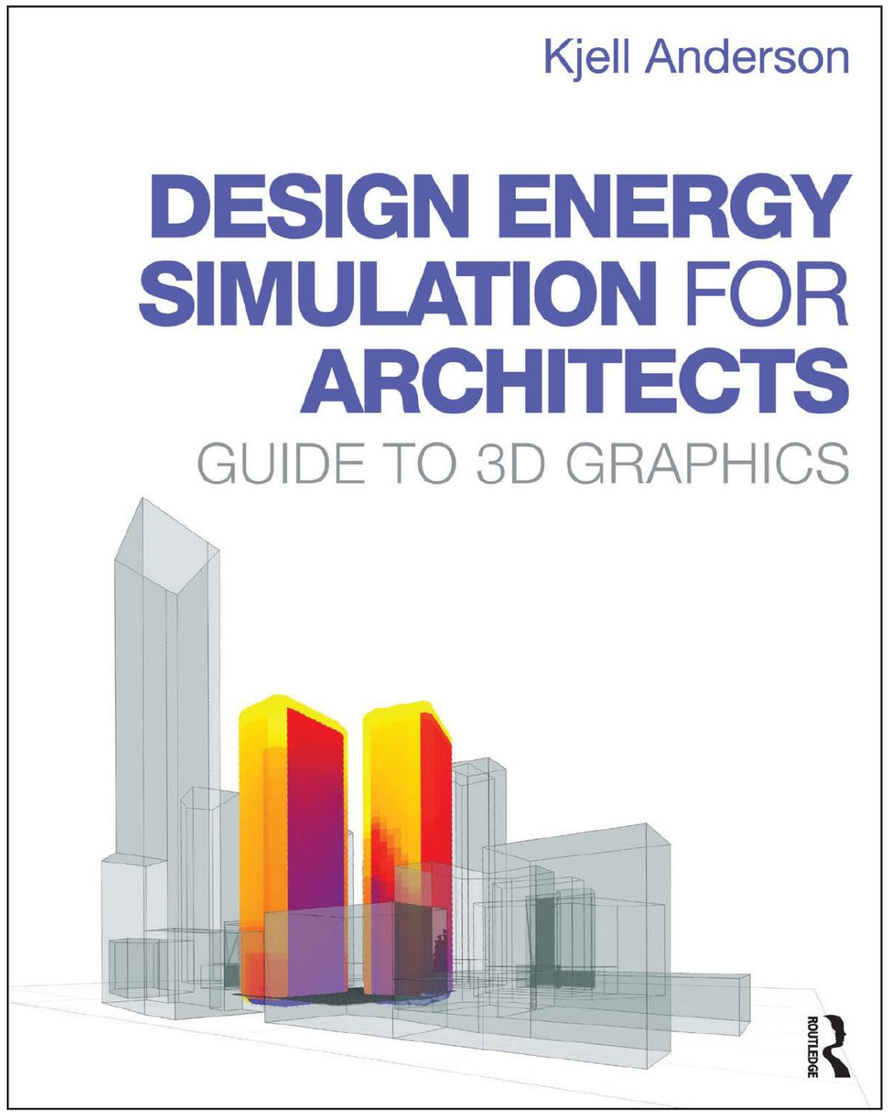
meets

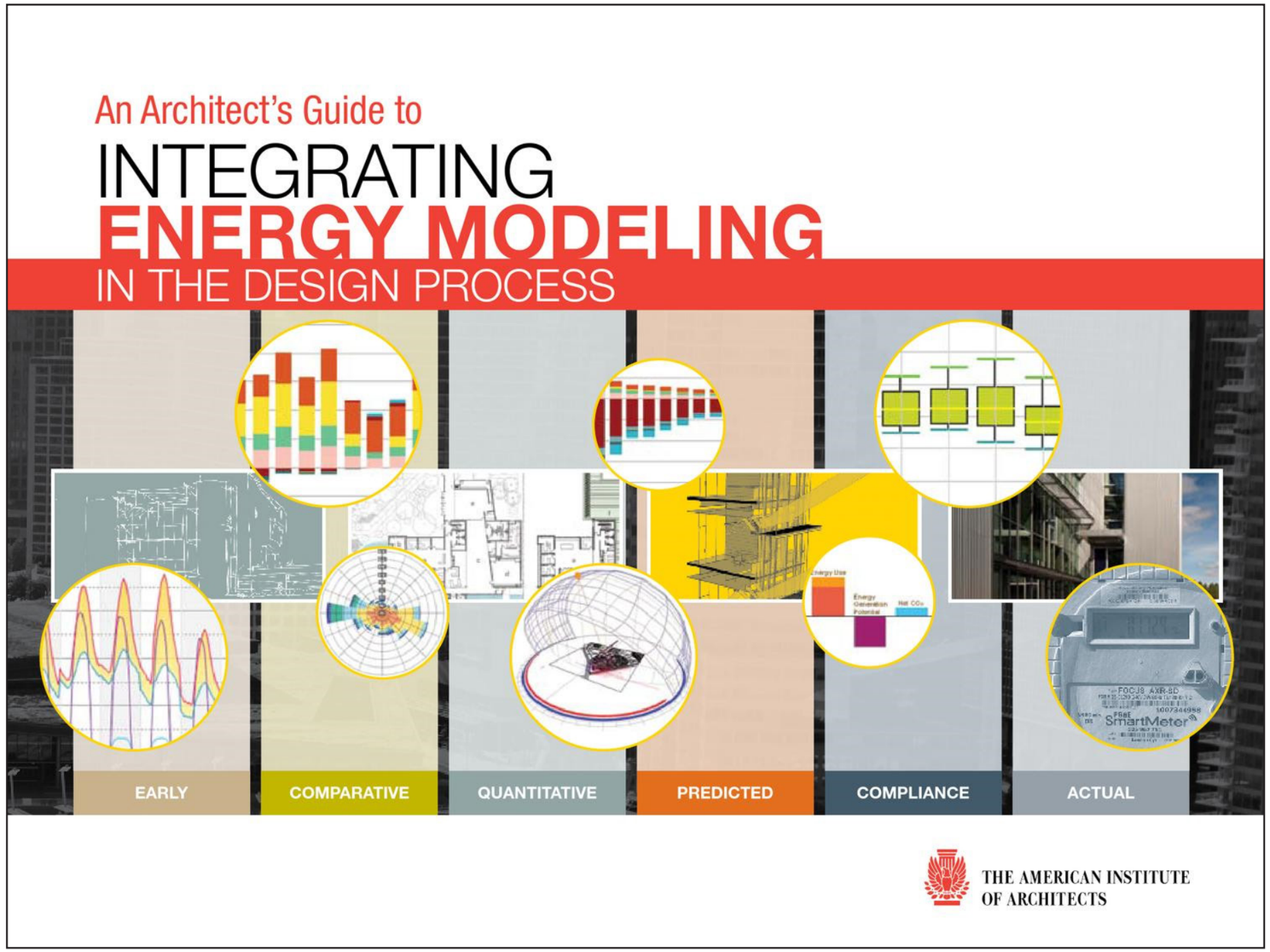
70%

of annual demand



ATTITUDES TOWARDS PROCESS
ARCHITECTS SHOULD BE MODELING IN HOUSE





LVL OF DETAIL

calibrated models

predictive models

WHOLE BLDG

detailed single zone

compliance modeling

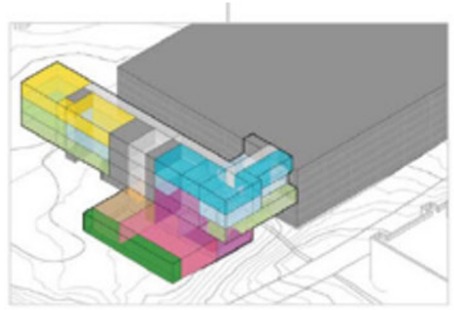
façade modeling

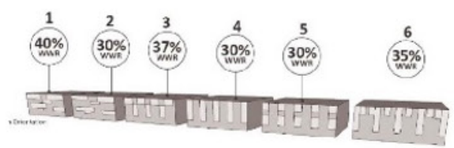
massing studies

SHOEBOX

HVAC templates

single zone analysis





OF ZONES

EXTERNAL

PROJECT TEAM

MEP

ENERGY CONSULTANT

SUSTAINABILITY TEAM

FACADE CONSULTANT

INTERNAL

50

50

5

4

2

2

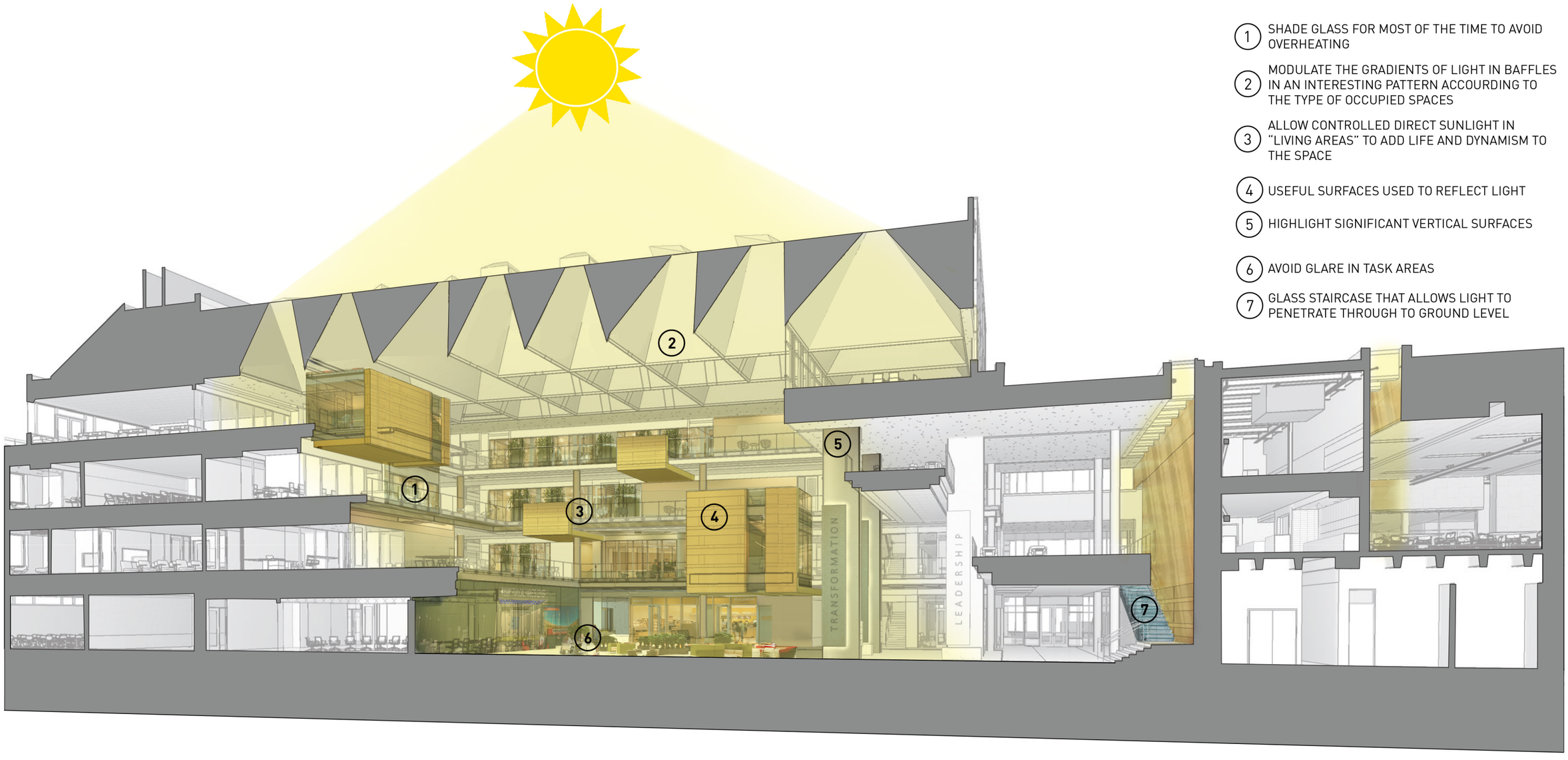
EDR

PRD

N+B

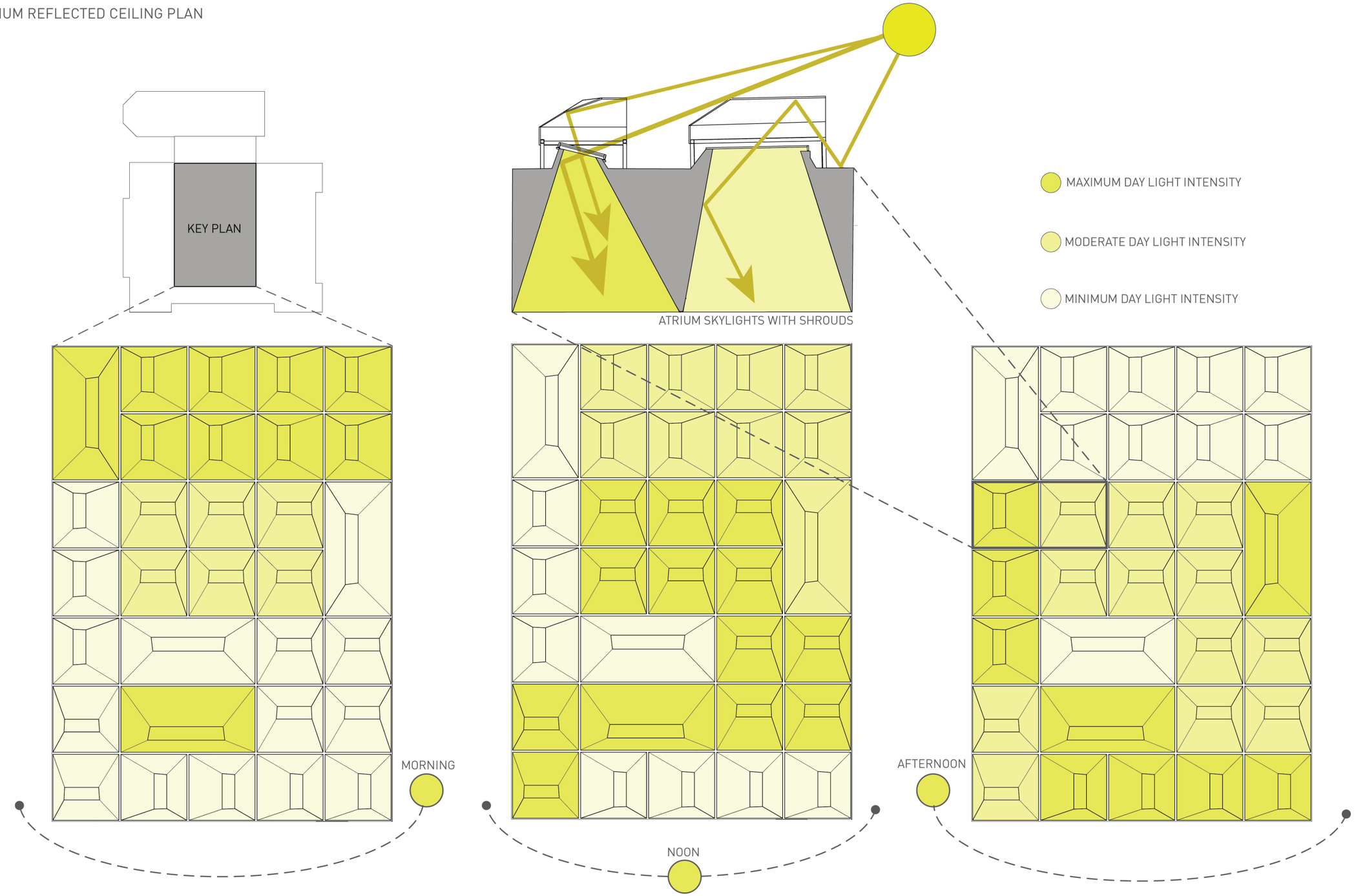
WHY ARCHITECTS SHOULD MODEL

OVERLAND - BAYLOR SCHOOL OF BUSINESS

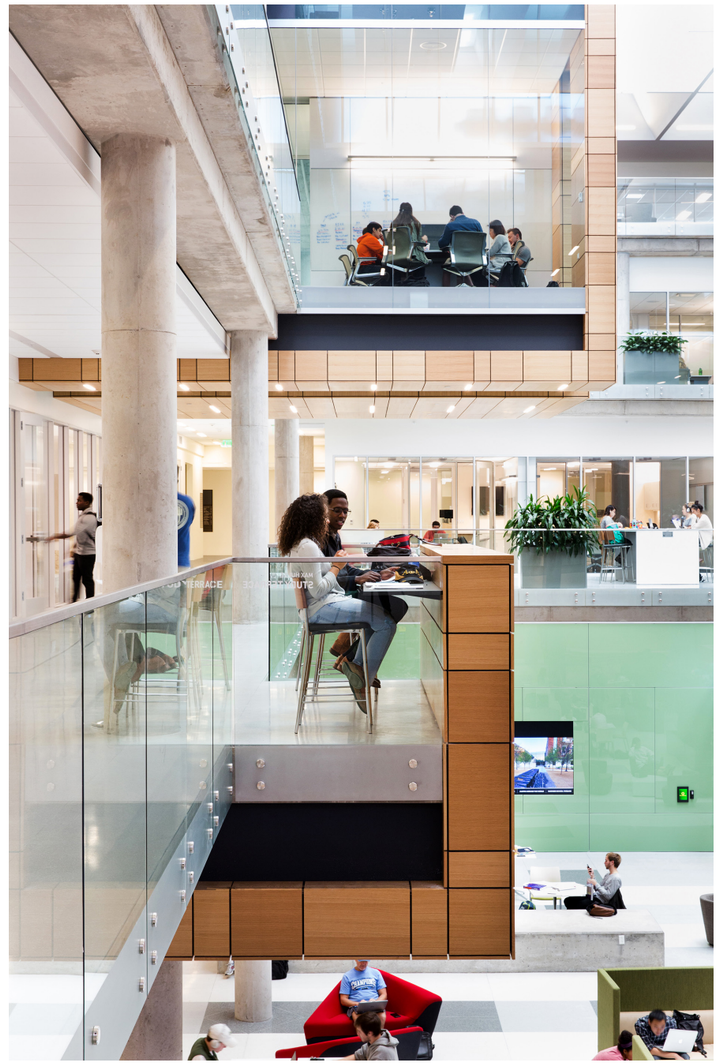


1. SHADE GLASS FOR MOST OF THE TIME TO AVOID OVERHEATING
2. MODULATE THE GRADIENTS OF LIGHT IN BAFFLES IN AN INTERESTING PATTERN ACCOURDING TO THE TYPE OF OCCUPIED SPACES
3. ALLOW CONTROLLED DIRECT SUNLIGHT IN "LIVING AREAS" TO ADD LIFE AND DYNAMISM TO THE SPACE
4. USEFUL SURFACES USED TO REFLECT LIGHT
5. HIGHLIGHT SIGNIFICANT VERTICAL SURFACES
6. AVOID GLARE IN TASK AREAS
7. GLASS STAIRCASE THAT ALLOWS LIGHT TO PENETRATE THROUGH TO GROUND LEVEL

ATRIUM REFLECTED CEILING PLAN

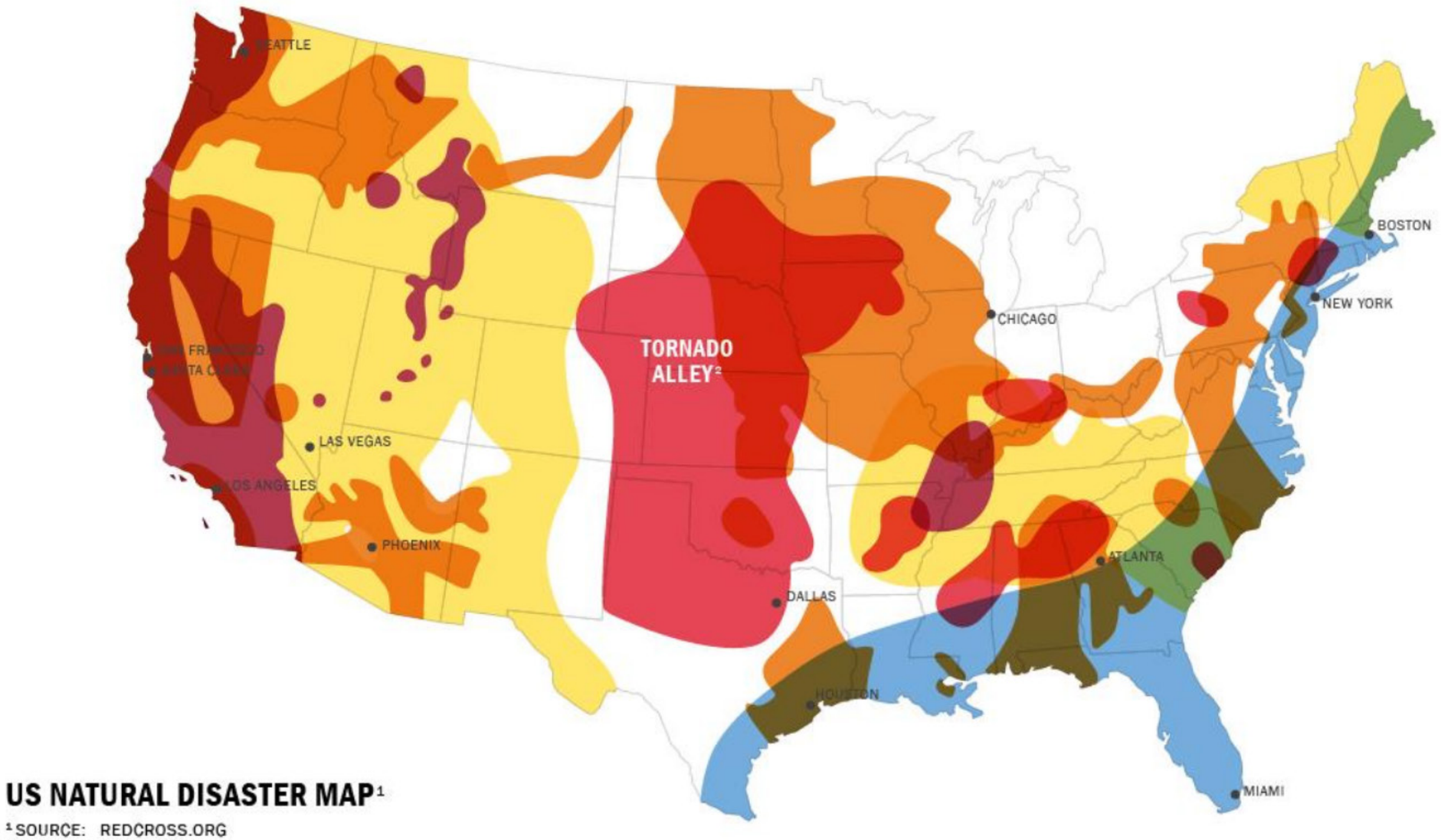



SERVICE
TRANSFORMATION



ATTITUDES TOWARDS RESILIENCE

WHAT EXACTLY IS IT? DEPENDS ON REGION/BUILDING TYPE



US NATURAL DISASTER MAP[1]

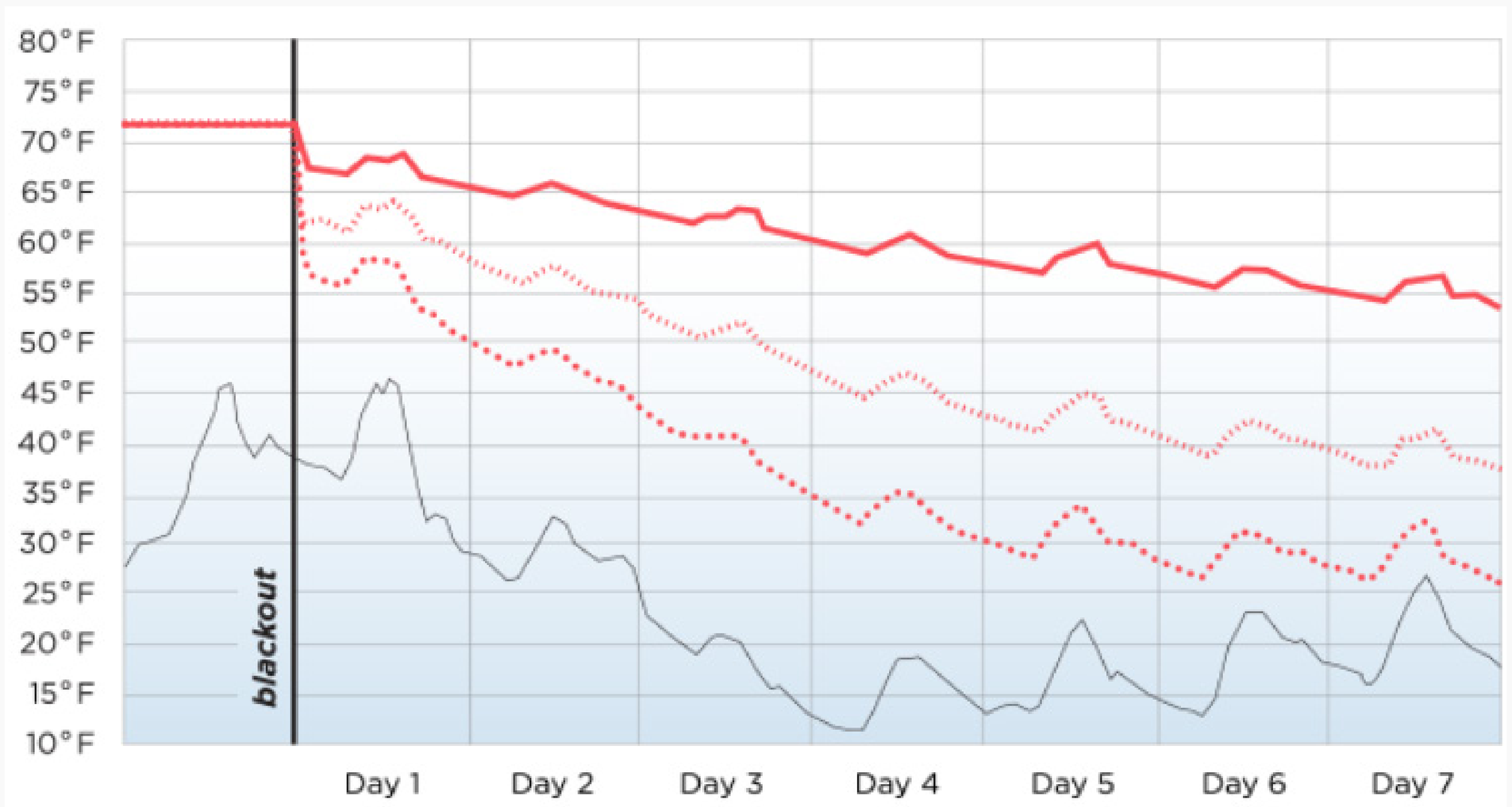
[1] SOURCE: REDCROSS.ORG
[2] SOURCE: NOAA.GOV

ATTITUDES TOWARDS RESILIENCE

THERMAL RESILIENCE

http://urbangreencouncil.org/babyitscol-dinside

WINTER - SINGLE FAMILY HOUSE



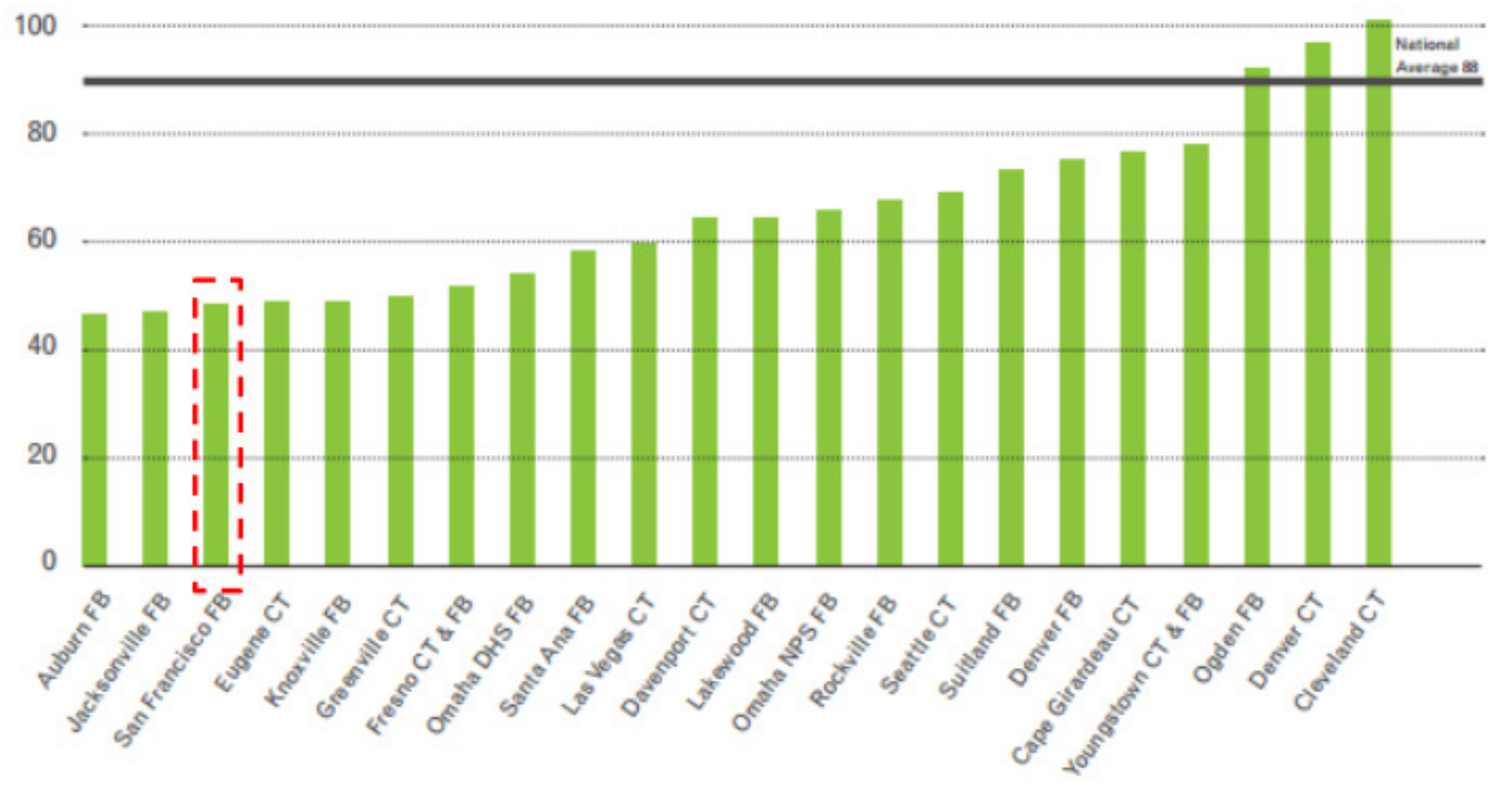
SALT LAKE CITY PUBLIC SAFETY BUIDLING

ATTITUDES TOWARDS POE

WE CARE ABOUT HOW THE BUILDING ACTUALLY PERFORMS

54%

ENERGY SAVINGS

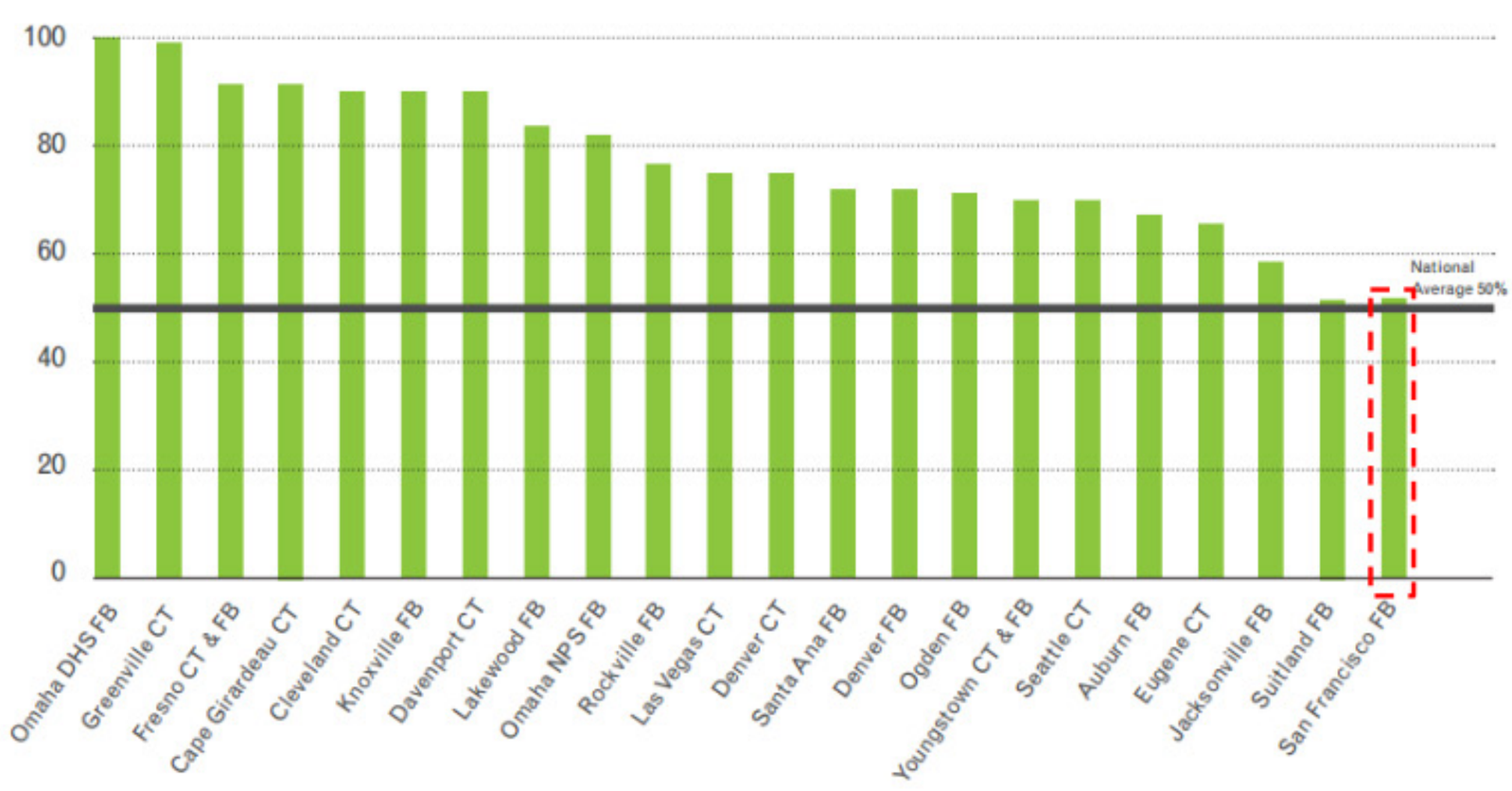


ATTITUDES TOWARDS POE

WE CARE ABOUT HOW THE BUILDING ACTUALLY PERFORMS

50%

SATISFACTION




?
?
?
?
% ENERGY SAVINGS
% OCCUPANT COMFORT SATISFACTION

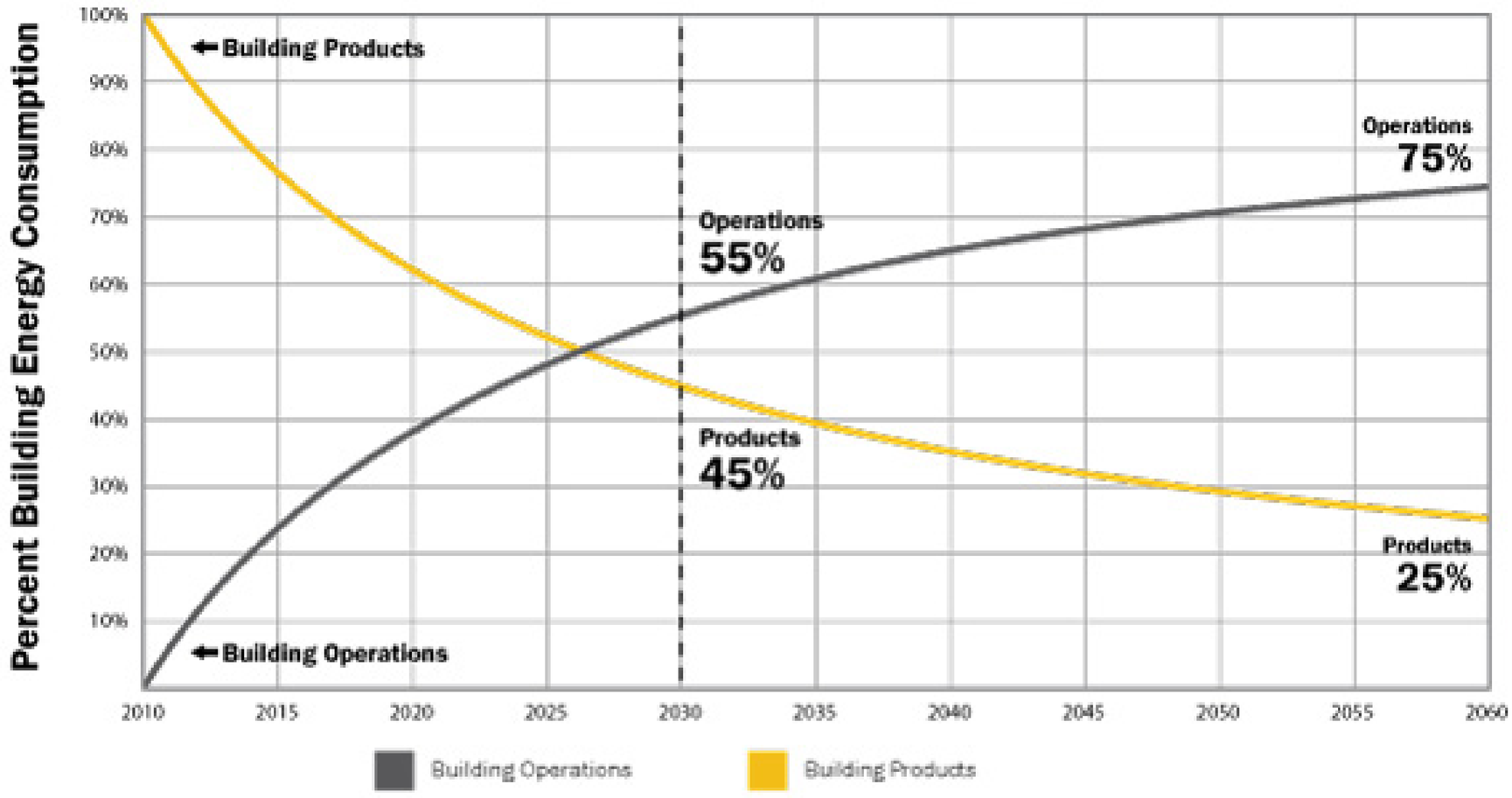
DO PEOPLE PREFER THE DAYLIGHT AND VIEWS FROM ALL-GLASS FACADES?

ARE OCCUPANTS MORE COMFORTABLE IN UNDERFLOOR AIR DISTRIBUTION SYSTEMS?

DO AUTOMATED BLIND SYSTEMS LEAD TO BETTER VISUAL COMFORT?

ATTITUDES ABOUT LIFE CYCLE

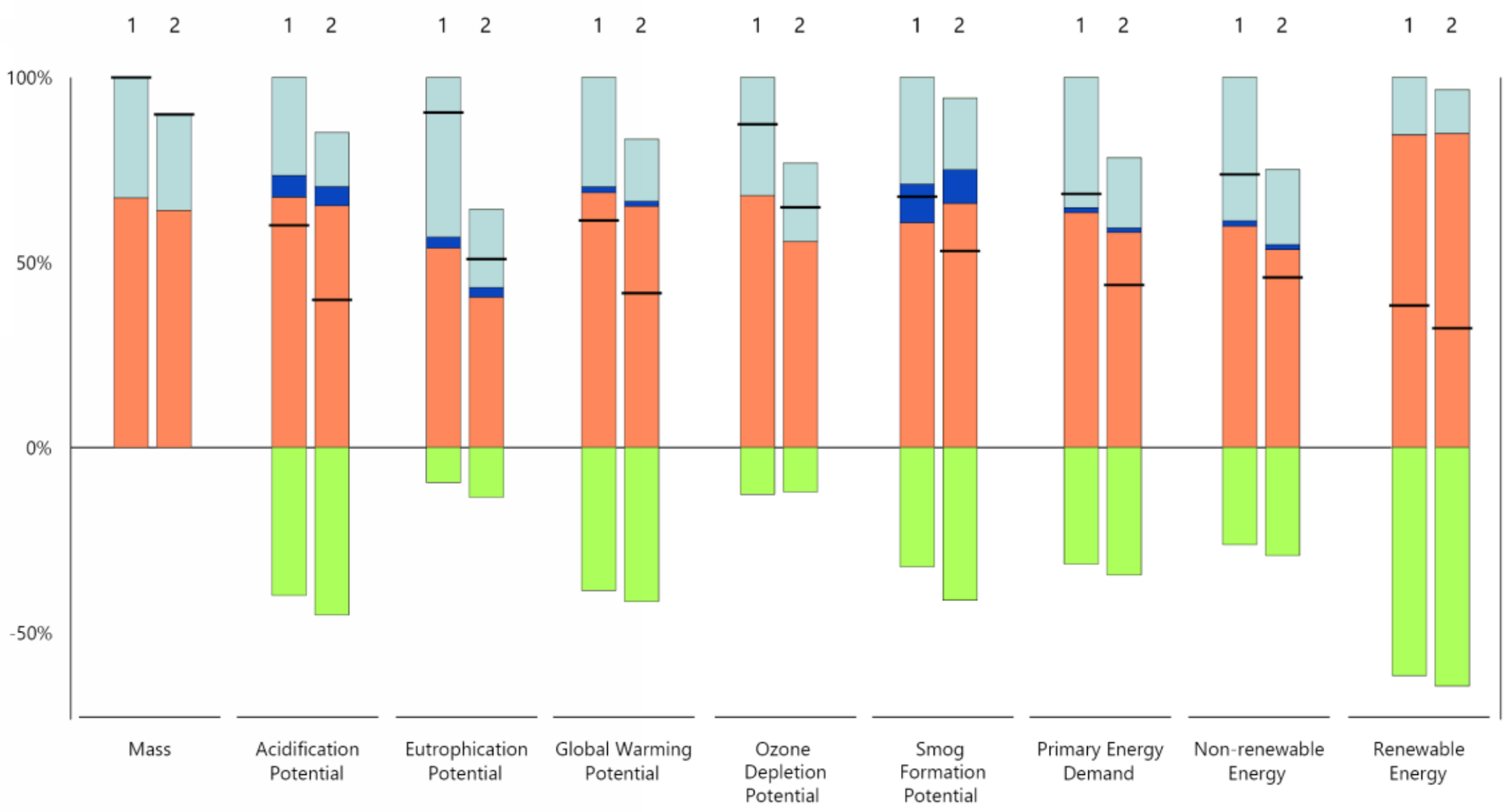
WE CARE ABOUT THE FULL LIFE CYCLE OF A BUILDING

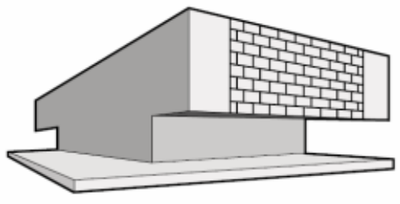


Operating/Embodied Energy (Typical Residence Built in 2010)

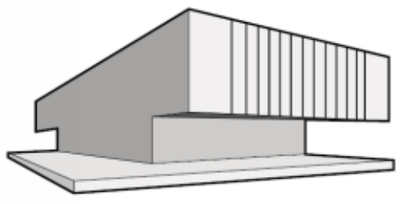
Data Source: EIA (2011), Richard Stein.

ATTITUDES ABOUT LIFE CYCLE
UNDERSTANDING THE MECHANICS





Option 1



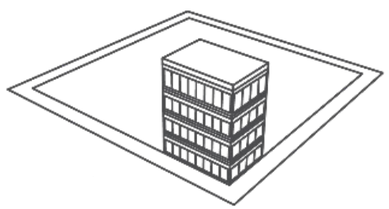
Option 2

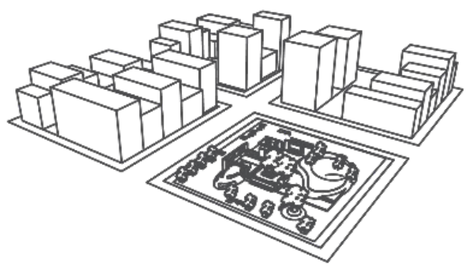
Life Cycle Stages

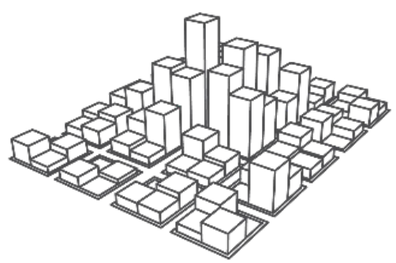
- Manufacturing
- Transportation
- Maintenance and Replacement
- End of Life
- Net Value (impacts and credits)

ATTITUDES TOWARD HEALTH

WHAT'S YOUR BUILDING'S HEALTH STORY?







MOLECULAR

CITY

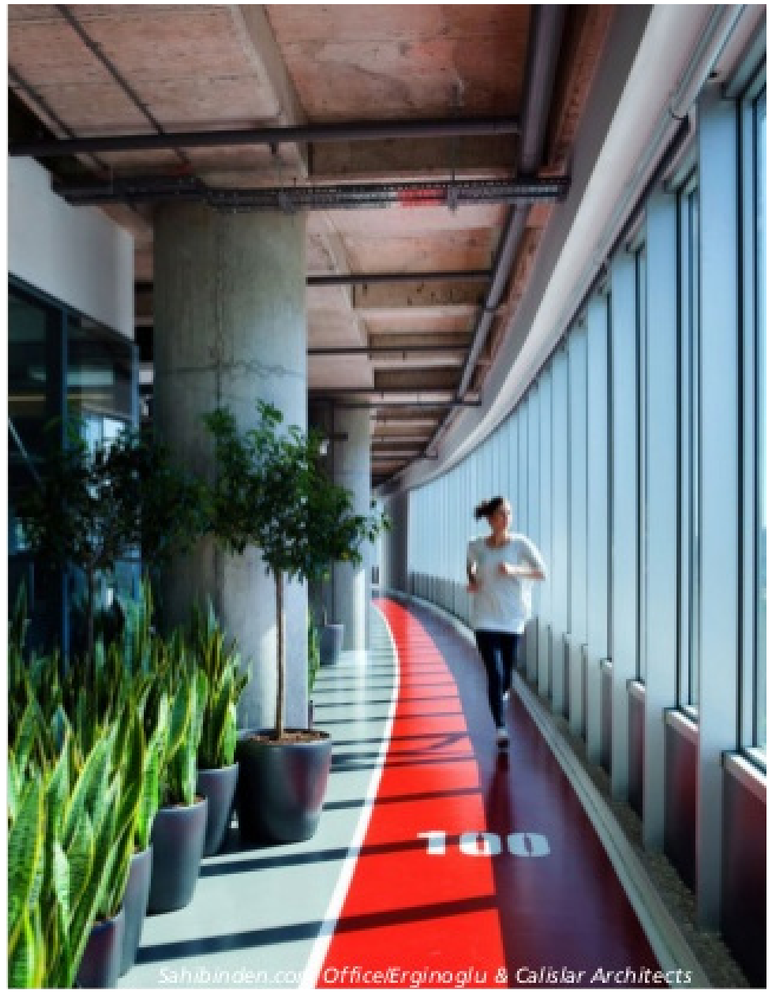
ATTITUDES
ENCOURAGING ACTIVITY

6+ sitting hours
in leisure time

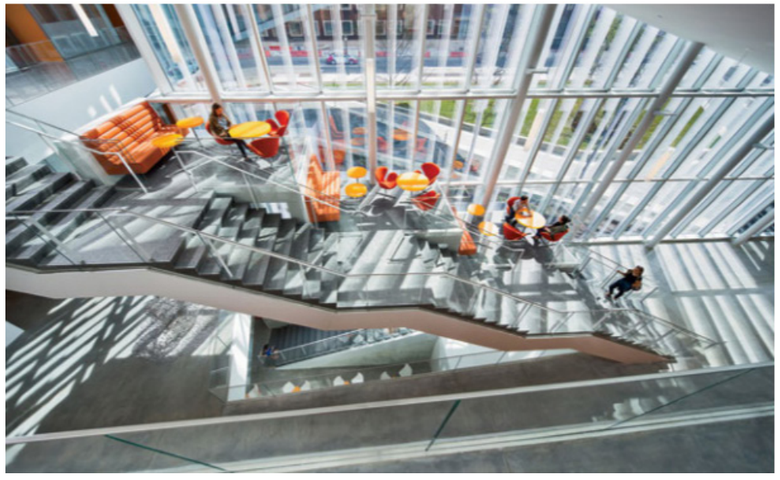
for men a 20%
higher death rate

for women 40%
higher death rate.

than for people sitting
3 hours or less



Sahibinden.com / Office/Erginoglu & Calislar Architects



ATTITUDES
HEALTHY MATERIALS

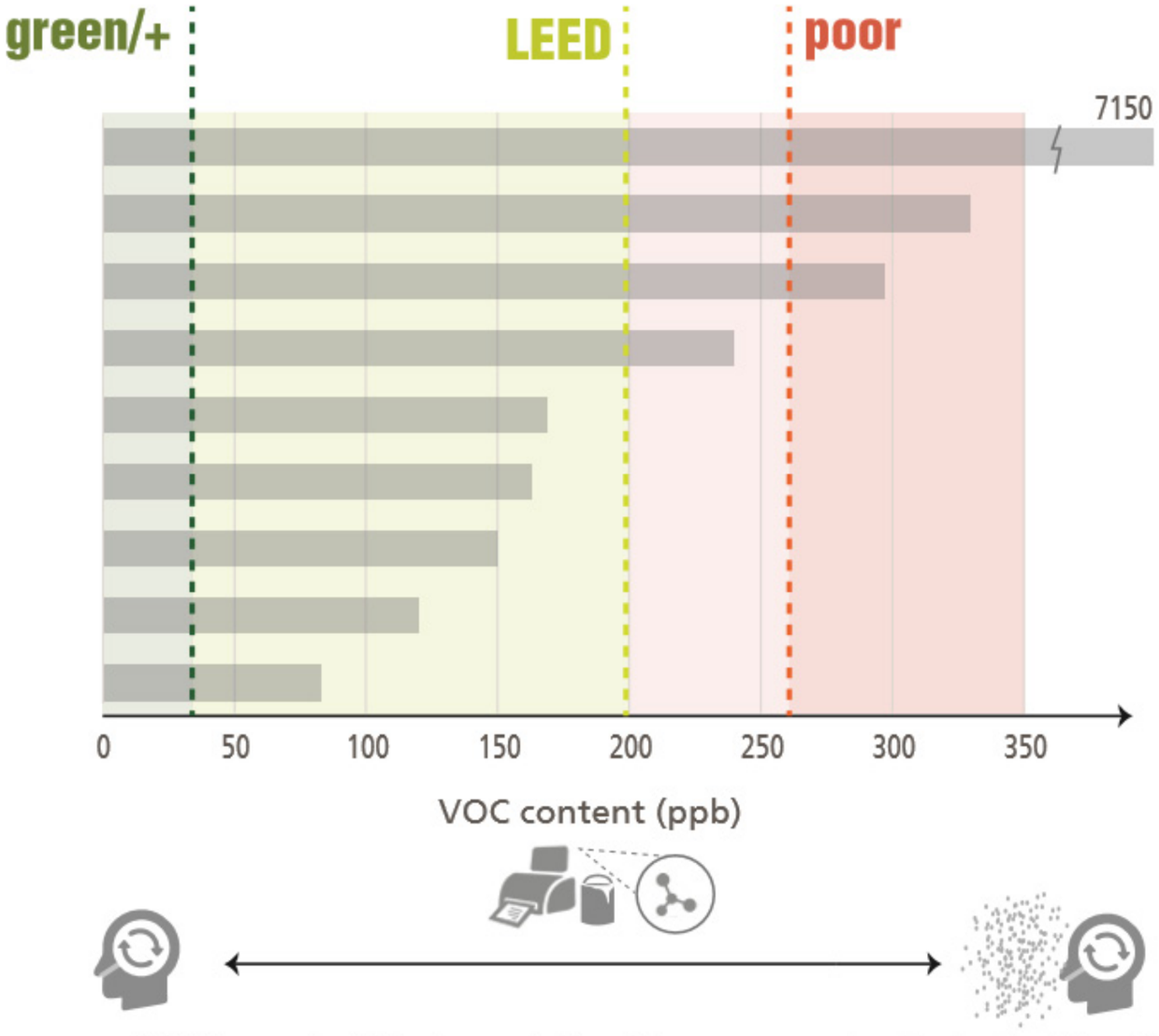
	FIBERGLASS BATT INSULATION	POLYURETHANE FOAM (HFCA-245fa)	SPF OPEN-CEL (WATER-BLOWN)	HONEYWELL SOLSTICE LIQUID BLOWING AGENT	CELLULOSE INSULATION	RIGID MINERAL WOOL	COTTON DENIM INSULATION
Low Life Cycle Cost *multiple of initial cost for fixes over 15 yrs*	exceeds	meets	does not meet	meets	exceeds	exceeds	does not meet
Low initial Cost $	exceeds	exceeds	does not meet	meets	exceeds	does not meet	does not meet
High insulation, resulting in improved energy efficiency *R-value*	somewhat meets *3.3/in*	meets *6.0/in*	meets *6.0/in*	exceeds *>6.0/in*	meets *3.7/in*	meets *4.0/in*	meets
Smooth surfaces low vapor pressure and high boiling point	does not meet	meets	meets	exceeds	does not meet	does not meet	does not meet
Low environmental impact global warming potential *ft²-R*	meets *<0.1*	does not meet *1.5*	meets *<0.1*	somewhat meets *1.0*	meets *<0.01*	meets *<0.1*	meets
Non-flammable By ASTM E-681 test method	somewhat meets	meets	does not meet	meets	meets	meets	meets
Safe for installers Low VOC	does not meet	somewhat meets	does not meet	meets	does not meet	does not meet	exceeds
Low negative health impact health in the environment, carcinogen production over life cycle	does not meet	does not meet	somewhat meets	does not meet	does not meet	does not meet	meets
Ease of application	somewhat meets	exceeds	exceeds	exceeds	exceeds	meets	meets
Quiet Environment Noise Reduction Coefficient	meets	meets	meets	meets	meets	meets	exceeds
SCORE oversimplification, not to be overemphasized	6	10	6	12	10.5	7	11.5

LEGEND

- does not meet the goal or impossible
- somewhat meets the goal or ok
- meets the goal or better
- exceeds the goal or best

red = -1
yellow = +1
light green = +1.5
green = +2

ATTITUDES
HEALTHY AIR



VOC Content in Office Spaces in New Orleans compared to thresholds defined by the 2015 Cognitive Effects Study

ATTITUDES
NEW 3RD PARTY CERTIFICATIONS

ATTITUDES TOWARDS DESIGN
LADDER OF ENGAGEMENT

Architectural Concept engages energy/ sustainability in a meaninful way

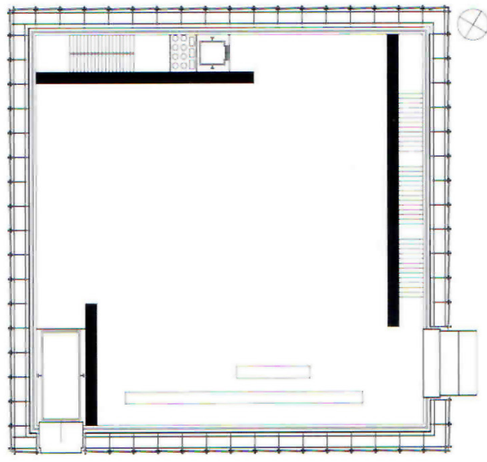
Performance criteria affects massing, envelope, design decisions, etc.

Make this glass box perform better

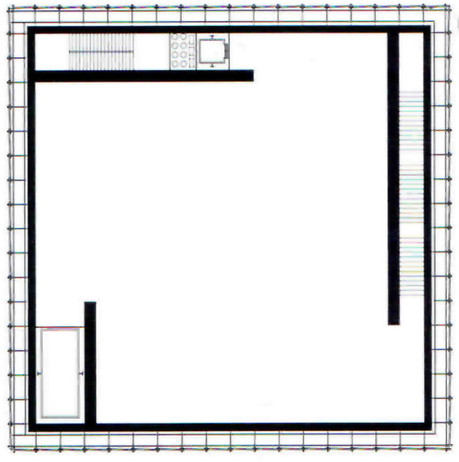
Help me make this building legal

ATTITUDES TOWARD DESIGN
ARCHITECTURAL CONCEPT INTEGRATION - PHYSICS

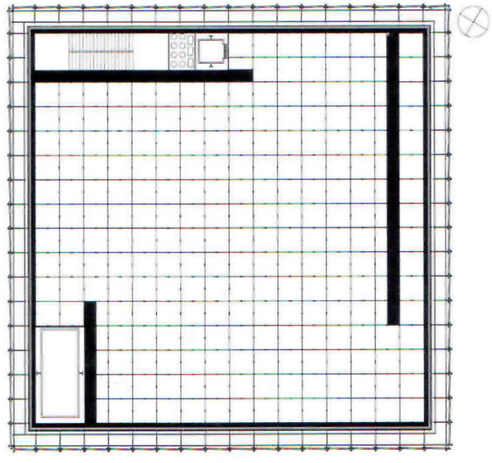
Kunsthaus - Peter Zumpthor



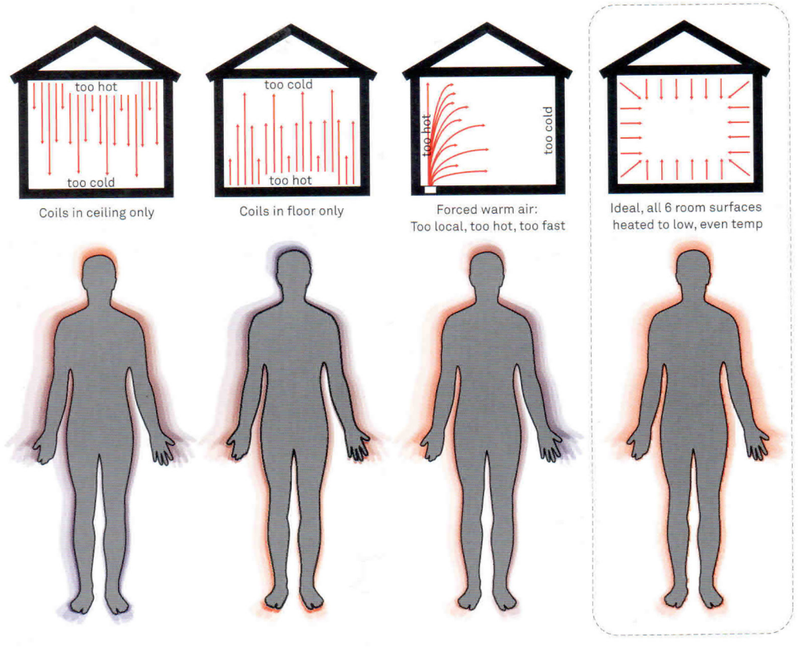
floor plan



floor plan



RCP

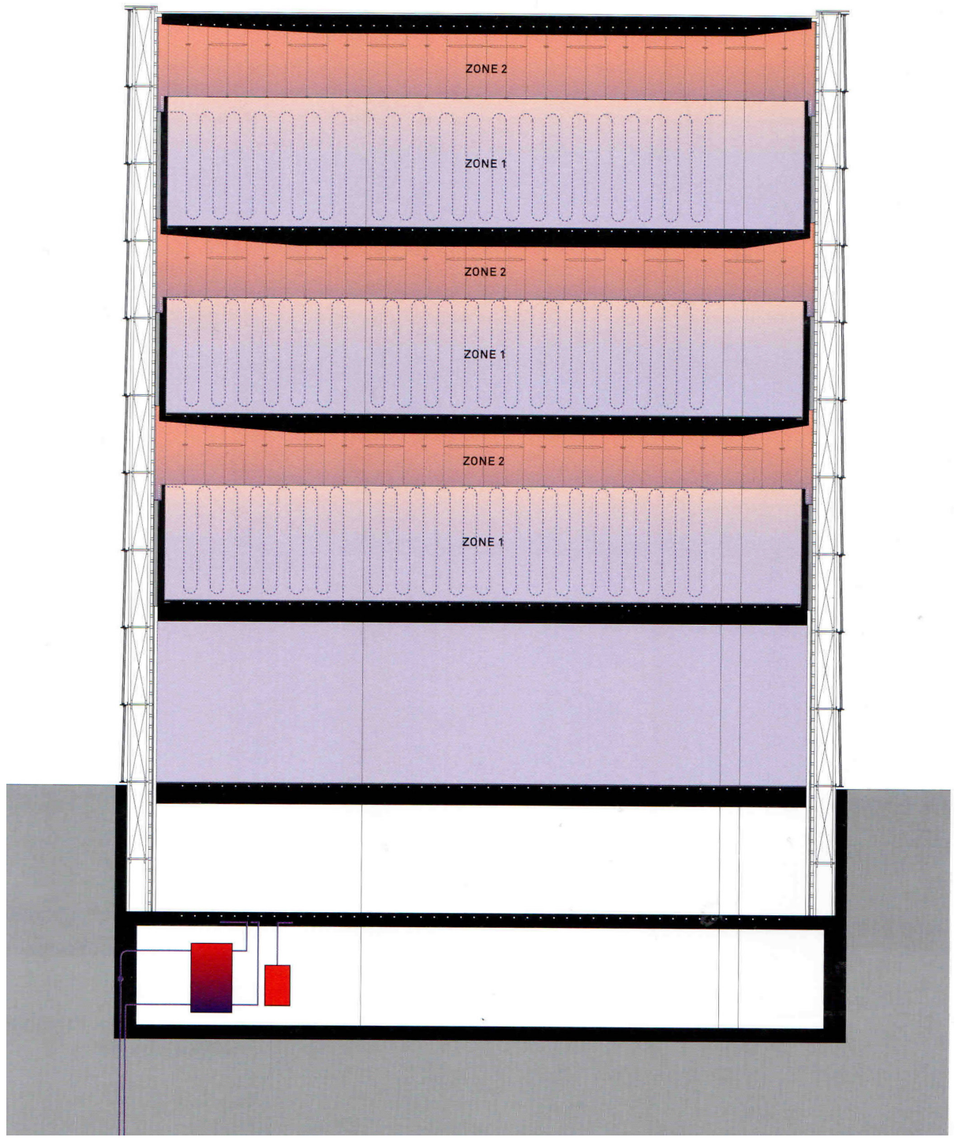


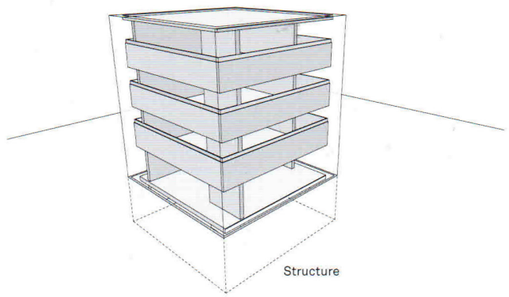
Coils in ceiling only

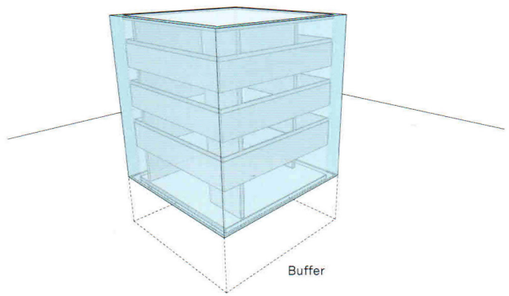
Coils in floor only

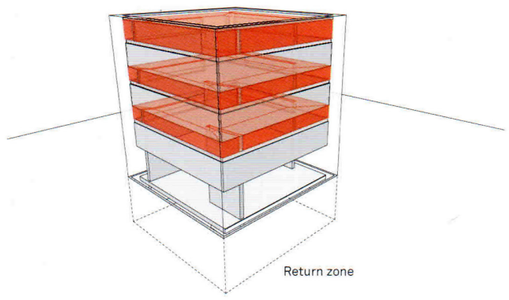
Forced warm air:
Too local, too hot, too fast

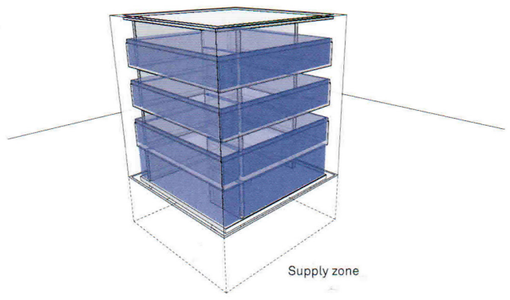
Ideal, all 6 room surfaces
heated to low, even temp

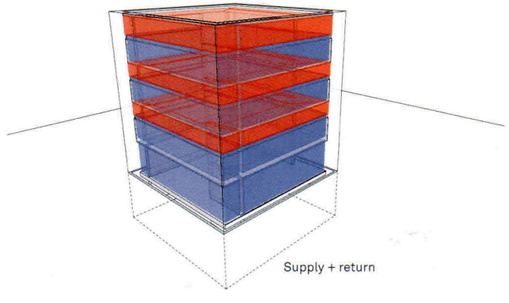


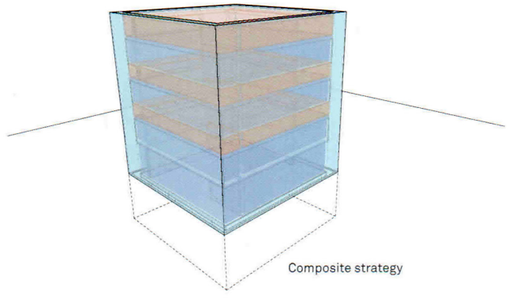

Structure


Buffer


Return zone


Supply zone


Supply + return

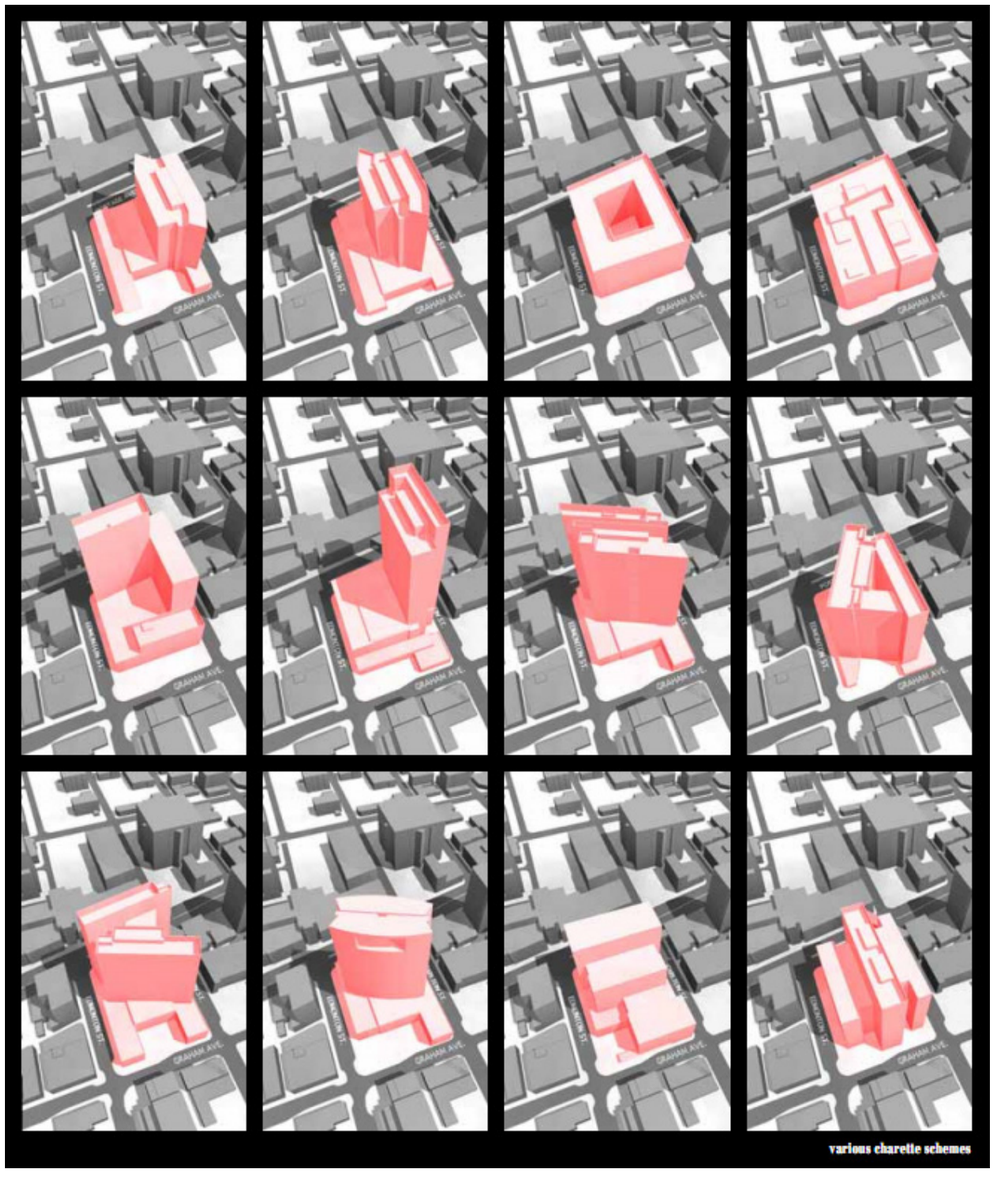

Composite strategy

97%↓A 65%↓$ 63%↓E

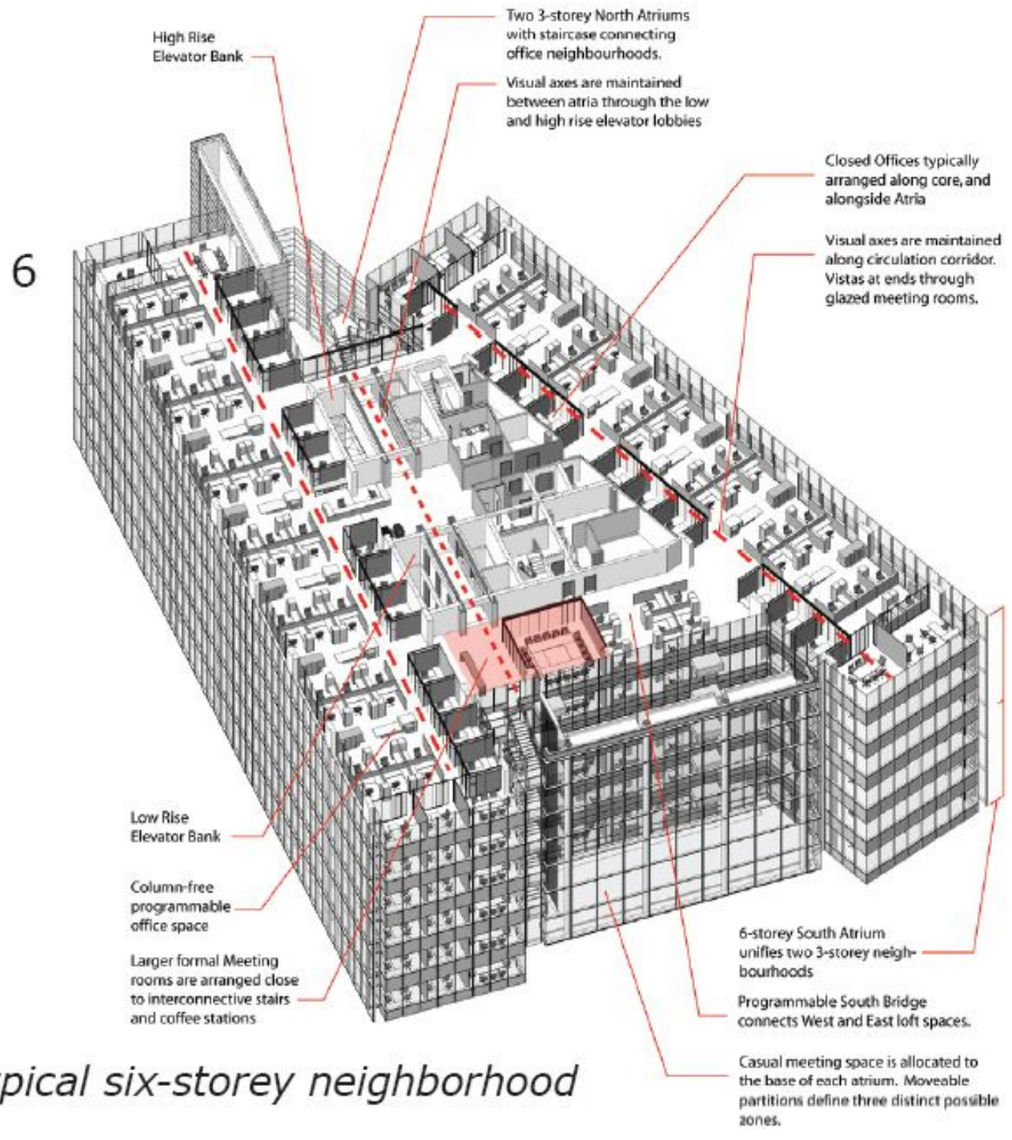
ATTITUDES TOWARD DESIGN

ARCHITECTURAL CONCEPT INTEGRATION - PASSIVE DESIGN

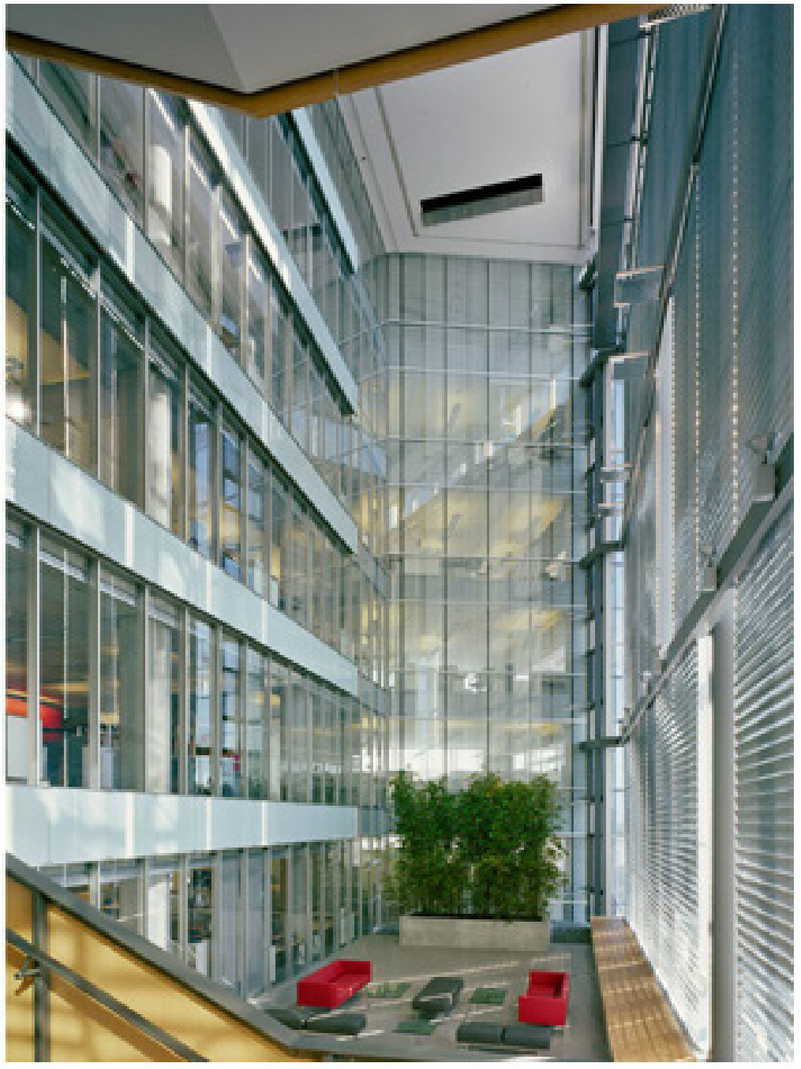
Manitoba Hydro - KPMB Arch - Winnapeg, Canada - HDD 10,858 CDD 1784

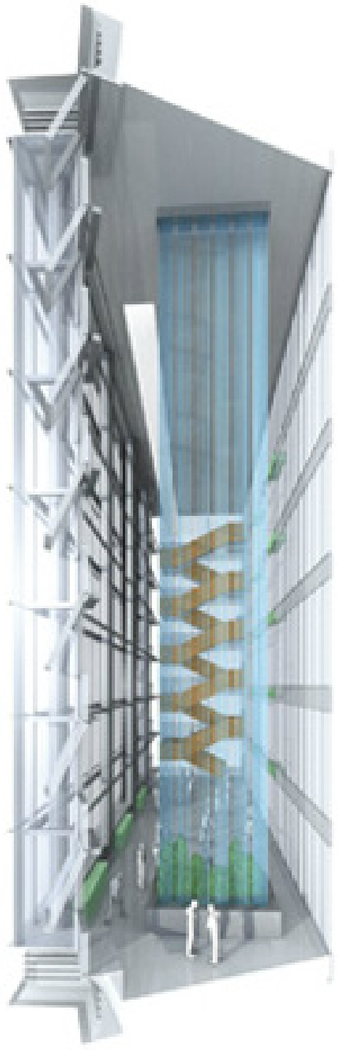


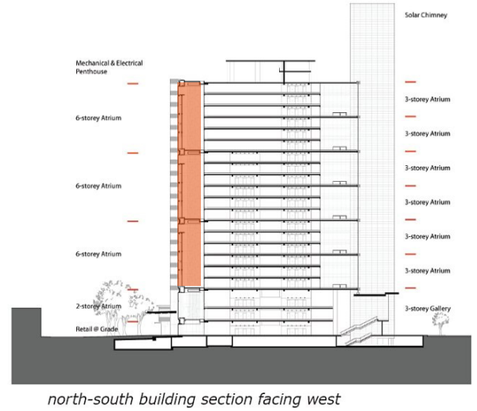
6



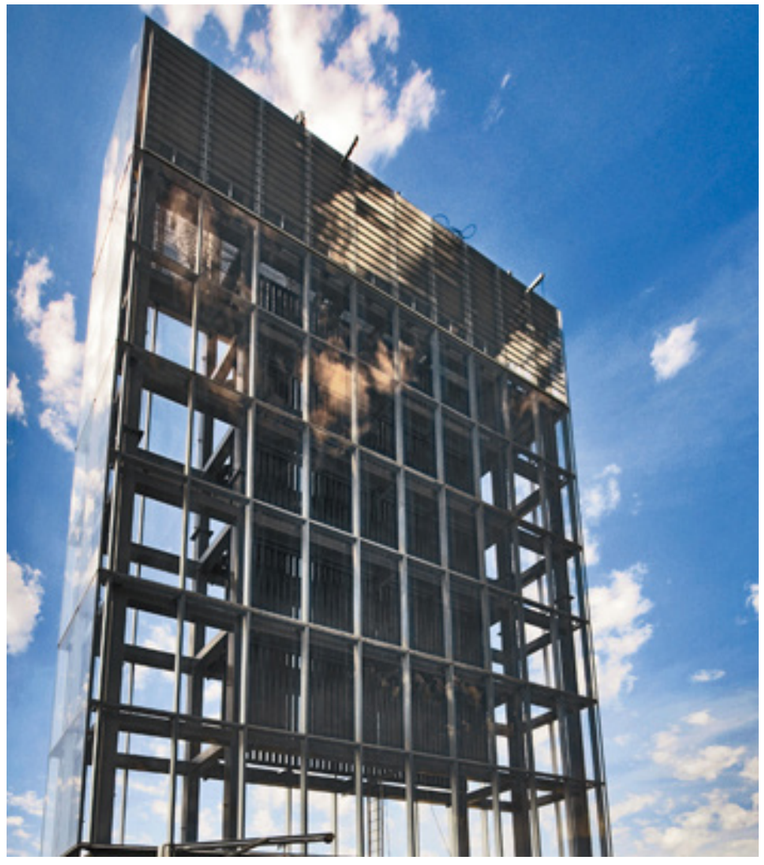
typical six-storey neighborhood

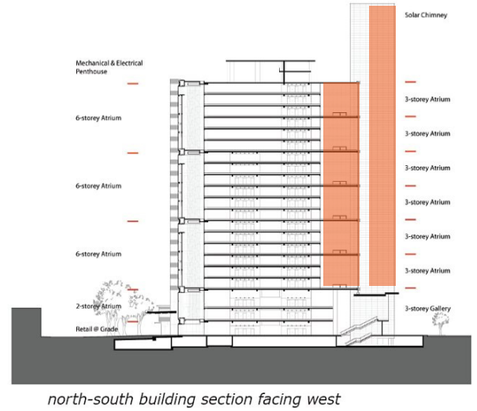






north-south building section facing west



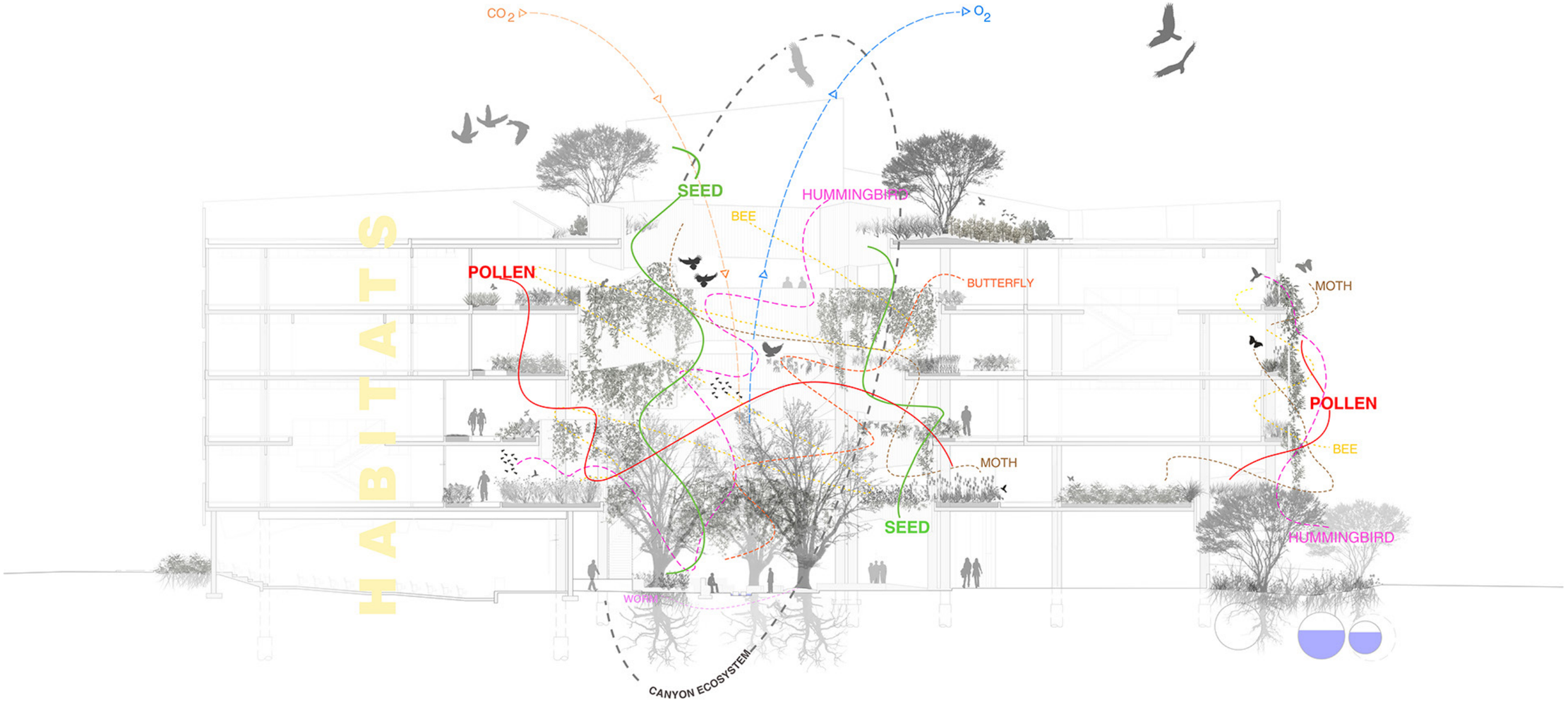


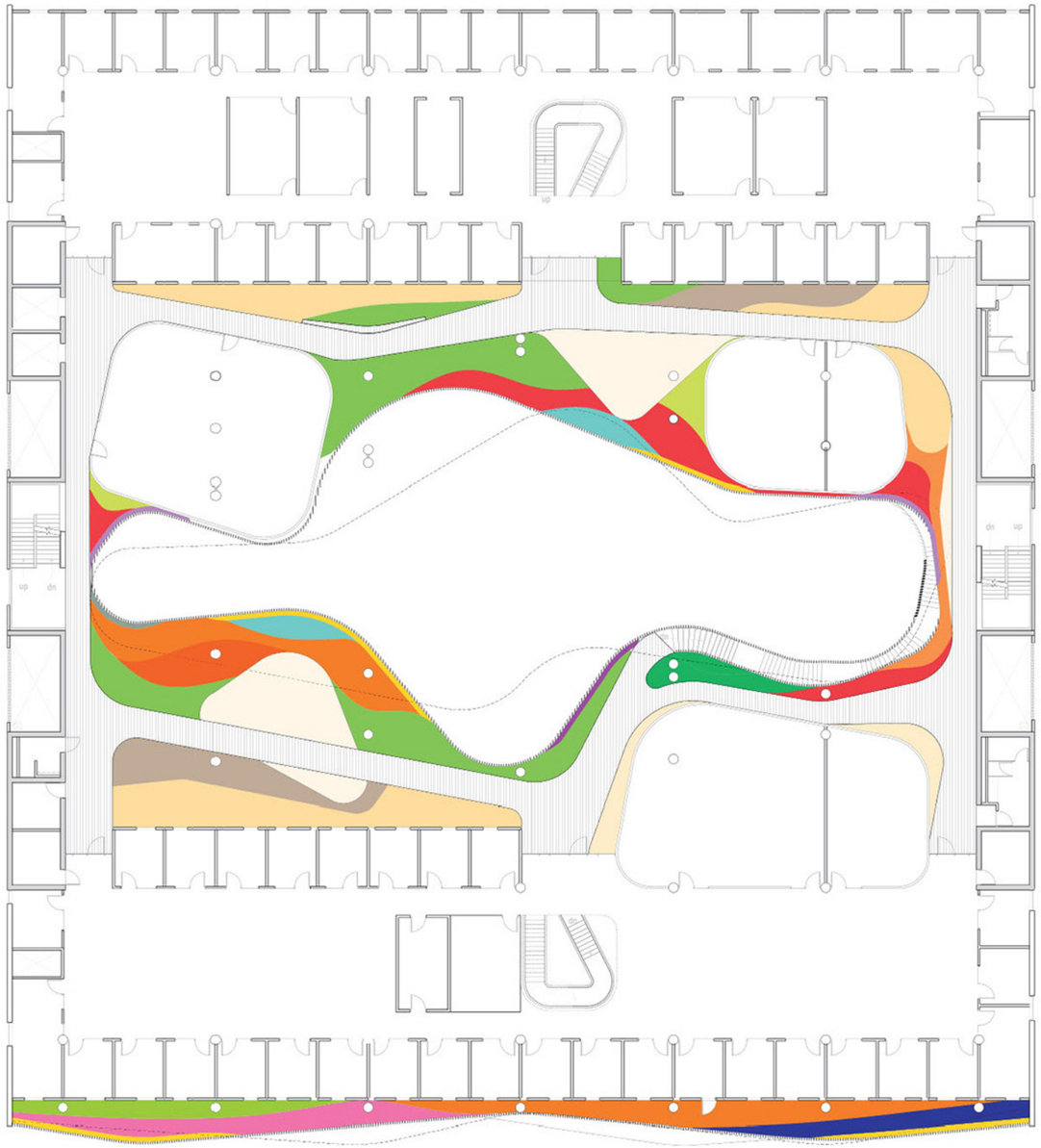
north-south building section facing west

ATTITUDES TOWARD DESIGN
ARCHITECTURAL CONCEPT INTEGRATION - METAPHOR

Environment + Natural Resources 2 - Richard Bauer

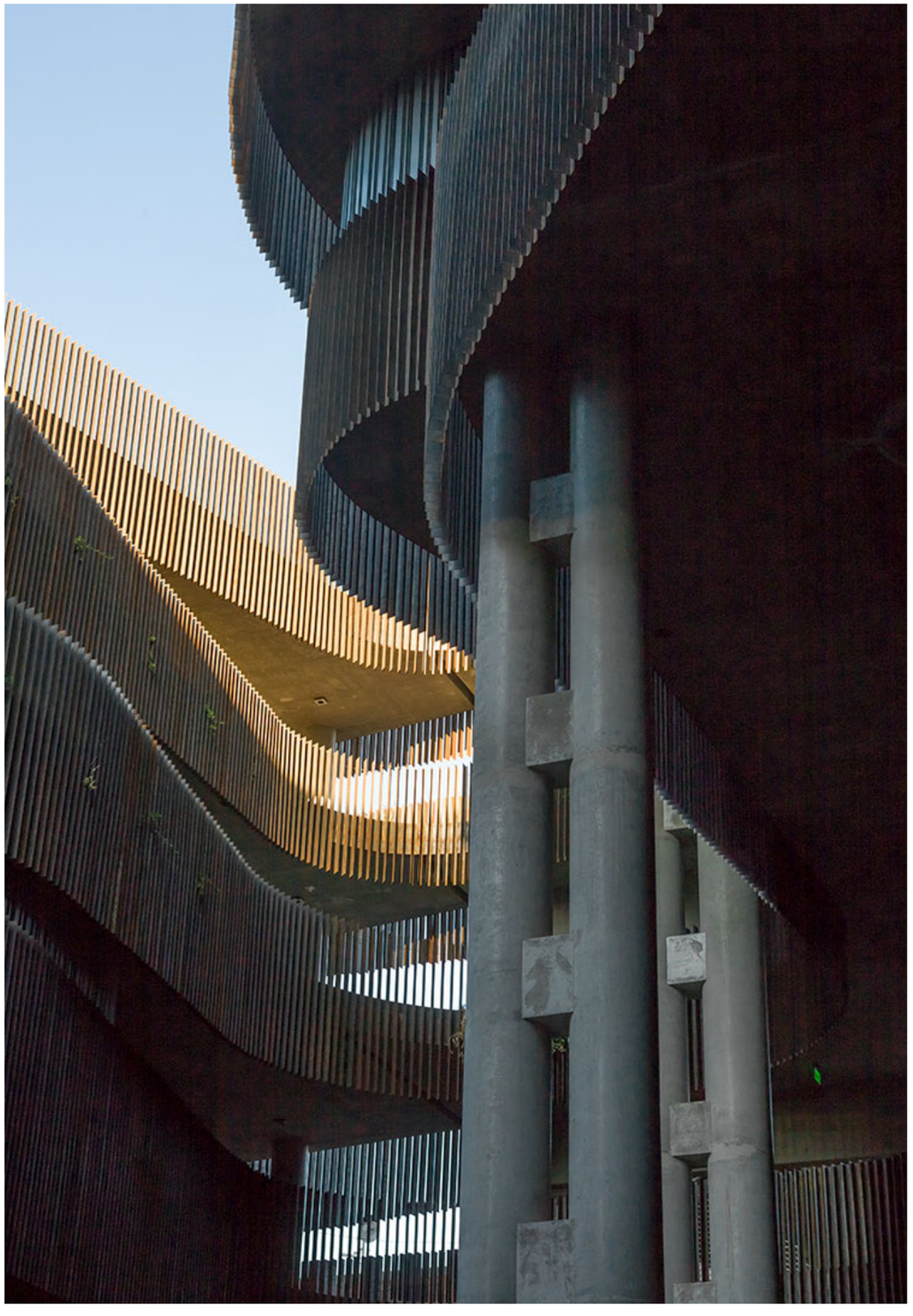
40% water redux
260,000 gallons/yr
thermal mass
solar chimneys
evaporative cooling


CO_2
O_2
SEED
HUMMINGBIRD
BEE
POLLEN
BUTTERFLY
MOTH
POLLEN
BEE
MOTH
SEED
HUMMINGBIRD
WORM
CANYON ECOSYSTEM
HABITATS



Legend

- Stabilized Decomposed Granite
- Rock I Mix (Medium Texture)
- Rock II Mix (Heavy Texture)
- *Agave chrysantha* / Golden Flower Agave
- *Agave palmeri* / Palmer's Agave
- *Calliandra eriophylla* / Pink Fairy Duster
- *Cissus trifoliatus* / Grape Ivy
- *Dasylirion wheeleri* / Desert Spoon
- *Datura wrightii* / Sacred Datura
- *Equisetum hyemale* / Horsetail Reed
- *Justicia californica* / Chuparosa
- *Lobelia cardinalis* / Cardinal Flower
- *Muhlenbergia dumosa* / Bamboo Muhly
- *Mascagnia macroptera* / Yellow Orchid Vine
- *Passiflora arizonica* / Arizona Passionflower
- *Peniocereus greggii* / Night Blooming Cereus
- *Woodwardia fimbriata* / Giant Chain Fern
- *Zauschneria californica* / California Fuscia




U.S. GREEN BUILDING COUNCIL
LEED PLATINUM
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TM

“The first act of architecture is to put a stone on the ground. That act transforms a condition of nature into a condition of culture. It is a holy act.”

Mario Botta