

The Business case for Healthy Buildings

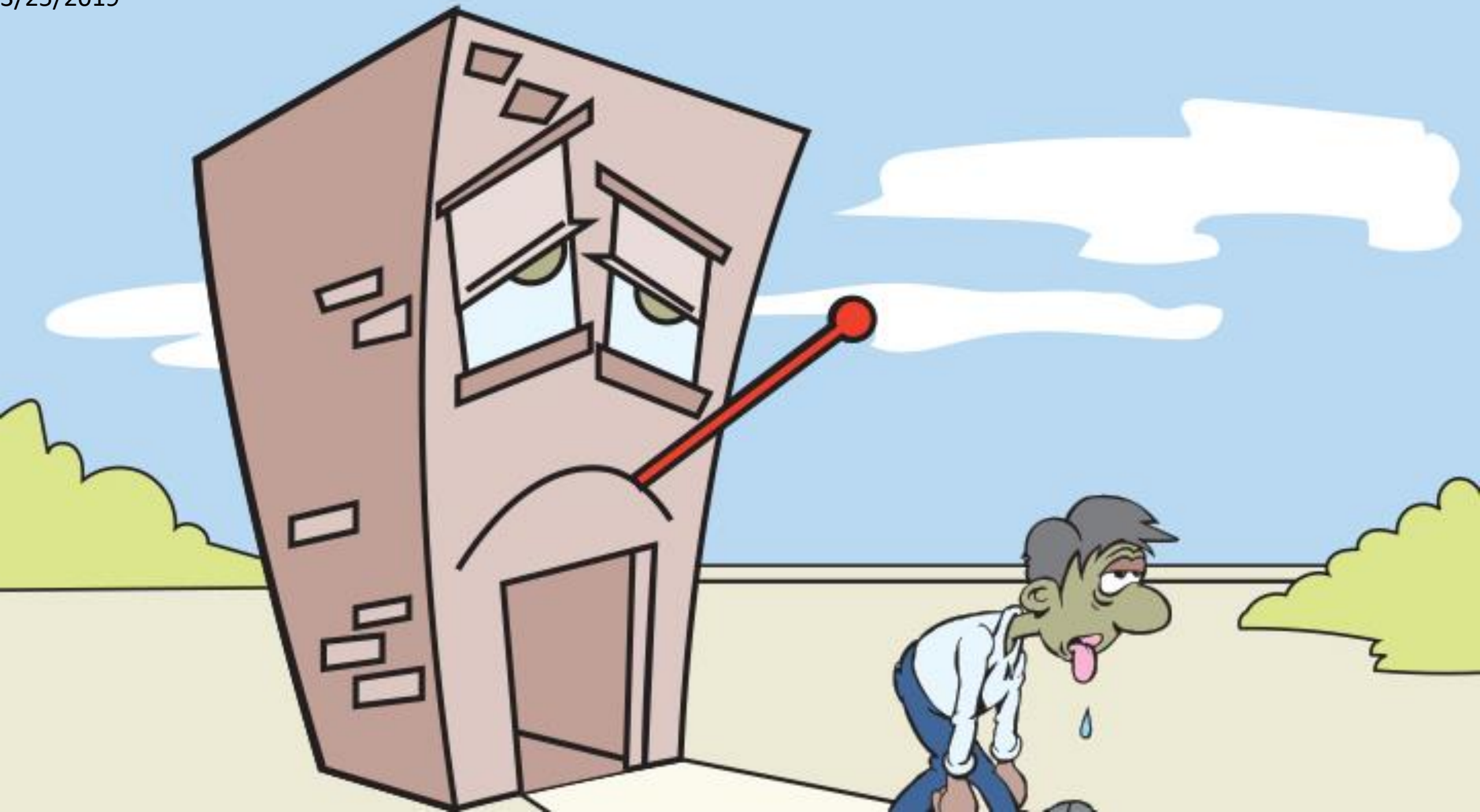
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March 28, 2019



“Health and Wellness is the next
Trillion Dollar Industry”

MCKINSEY



EIGHT FEATURES THAT MAKE HEALTHIER AND GREENER OFFICES

1. INDOOR AIR QUALITY & VENTILATION

Healthy offices have low concentrations of CO₂, VOCs (volatile organic compounds) and other pollutants, as well as high ventilation rates.



101%

WHY?
increase in cognitive scores for workers in a green, well-ventilated office.¹

2. THERMAL COMFORT

Healthy offices have a comfortable temperature range which staff can control.



6%

WHY?
fall in staff performance when offices are too hot and 4% if too cold.²

3. DAYLIGHTING & LIGHTING

Healthy offices have generous access to daylight and self-controlled electrical lighting.



WHY?

46 minutes
more sleep for workers in offices near windows.³

4. NOISE & ACOUSTICS

Healthy offices use materials that reduce noise and provide quiet spaces to work.



66%

WHY?
fall in staff performance as a result of distracting noise.⁴

5. INTERIOR LAYOUT & ACTIVE DESIGN

Healthy offices have a diverse array of workspaces, with ample meeting rooms, quiet zones, and stand-sit desks, promoting active movement within offices.



WHY?

Flexible working helps staff feel more in control of their workload and engenders loyalty.⁵

6. BIOPHILIA & VIEWS

Healthy offices have a wide variety of plant species inside and out as well as views of nature from workspaces.



7-12%

WHY?
improvement in processing time at one call centre when staff have a view of nature.⁶

7. LOOK & FEEL

Healthy offices have colours, textures, and materials that are welcoming, calming and evoke nature.



WHY?

Visual appeal is a major factor in workplace satisfaction.⁷

EMPLOYEE ENGAGEMENT



Healthy offices have employees that are regularly consulted and that feedback is used to drive continuous improvement.⁸

8. LOCATION & ACCESS TO AMENITIES

Healthy offices have access to public transport, safe bike routes, parking and showers, and a range of health food choices.



€27m

WHY?

savings through cutting absenteeism as a result of Dutch cycle-to-work scheme.⁹

What makes a “healthy building” and a “healthy place?”

MIXED USE

Recommendations that apply but are not shown:

6 7 8 10 11 13 14 15 16 18



KEY

Evidence-Based Recommendations

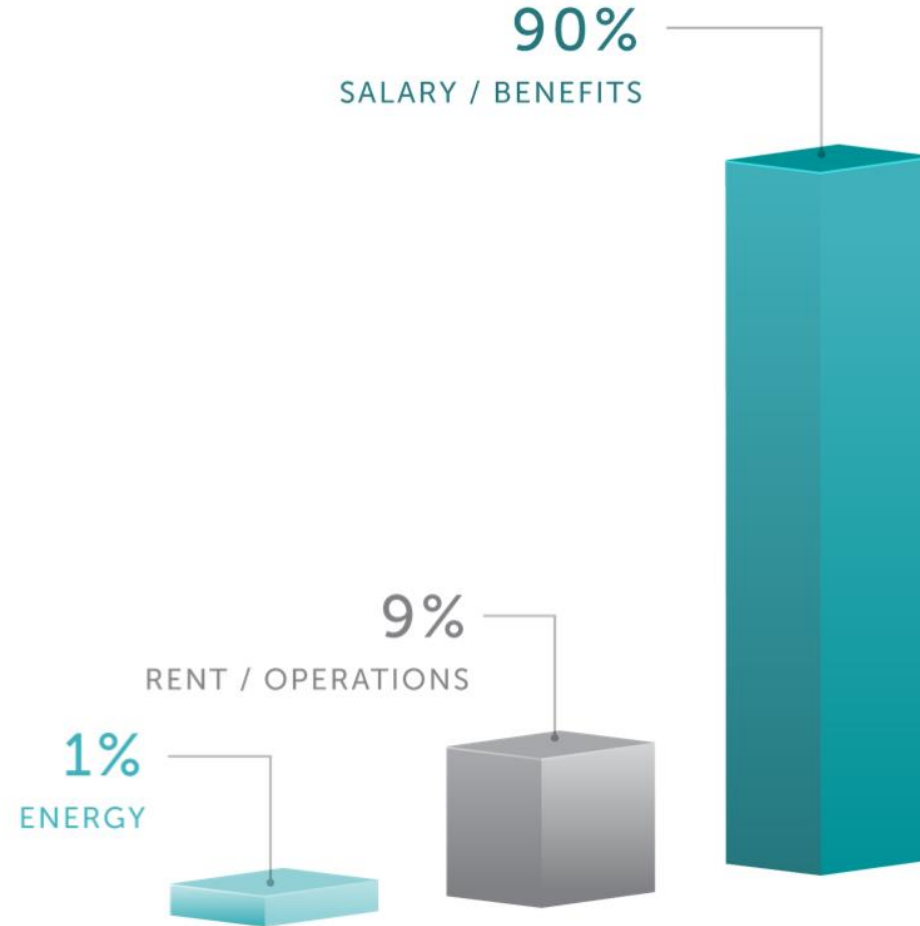
- | | | | |
|----------|---|-----------|--|
| 1 | Incorporate a mix of land uses | 9 | Accommodate a grocery store |
| 2 | Design well-connected street networks at the human scale | 10 | Host a farmers market |
| 3 | Provide sidewalks and enticing, pedestrian-oriented streetscapes | 11 | Promote healthy food retail |
| 4 | Provide infrastructure to support biking | 12 | Support on-site gardening and farming |
| 5 | Design visible, enticing stairs to encourage everyday use | 13 | Enhance access to drinking water |
| 6 | Install stair prompts and signage | 14 | Ban smoking |
| 7 | Provide high-quality spaces for multigenerational play and recreation | 15 | Use materials and products that support healthy indoor air quality |
| 8 | Build play spaces for children | 16 | Facilitate proper ventilation and airflow |
| | | 17 | Maximize indoor lighting quality |
| | | 18 | Minimize noise pollution |
| | | 19 | Increase access to nature |
| | | 20 | Facilitate social engagement |
| | | 21 | Adopt pet-friendly policies |

A low-angle, black and white photograph of several tall skyscrapers reaching towards a cloudy sky. The perspective creates a sense of height and scale. The buildings have repetitive window patterns, and the sky is filled with soft, white clouds.

What's the business case for healthy buildings?

INVEST IN PEOPLE FOR RETURN ON INVESTMENT

Source: Knoll Workplace Research "What's Good for People, Moving from Wellnes to Well Being", Kate Lister 2004 Studies include those conducted by organizations including Harvard Business Review and World Economic Forum and the American Journal of Health Promotion Image courtesy of World Green Building Counsel Report "Health, Wellbeing & Productivity in Offices"



“

101% improvement in
cognitive scores in a low VOC,
well-ventilated office

”



. Lan L. Wargocki P. Wyon DP. Lian Z. (2011) Effects of thermal discomfort in an office on perceived air quality, SBS symptoms, physiological responses, and human performance. Indoor Air 21:5, pp 376-90

“

Occupants of green-certified, high-performing buildings saw 26 percent higher cognitive function scores, slept better and reported fewer health symptoms compared to those in similarly high-performing buildings that were not green-certified

”



HARVARD
SCHOOL OF PUBLIC HEALTH

Harvard, The impact of working in a green certified building on cognitive function and health, 2017

“

7-12% increase in call
center productivity
for employees with a
view of nature ”



Heschong Mahone Group (2003) Windows and Offices: a Study of Worker Performance and the Indoor Environment (Technical Report) for California Energy Commission, 2003 pp 2-4. Available: <http://www.energy.ca.gov/2003publications/CEC-500-2003-082/CEC-500-2003-082-A-09>. PDF Last accessed 12 August 2014

“ 97% increase in sales-generated leads and 101% increase in leads per call in new green, healthy office. ”



St Gobain, new LEED-Certified office with a focus on health

“ 3.5 fewer sick days
per employee in
their new healthy
office ”



SKANSKA

The business case for healthy buildings

- ✓ **Tenants**: attract talent, reduce absenteeism, reduce turnover, increase productivity.
- ✓ **Designers**: more interesting projects, more revenue, market differentiation.
- ✓ **Service providers**: a new standard to certify to, provide technology for, and help clients navigate.
- ✓ **Society**: healthier workers reduce the social cost of health care, and indirectly lead to more tax revenue (live longer, work longer, act as productive members of society.)

Healthy building certification – small but growing





DEVELOPERS...

What's MY business case for healthy buildings?

OK, so where is the business case for developers?

1. More rent? Lower vacancy rates?
2. Higher development yield?
3. Economic incentives for a certified building? (density, tax abatement, faster permitting?)
4. Can I even achieve the certification?
5. How much will it cost?
6. Will the market reward me for my investment?

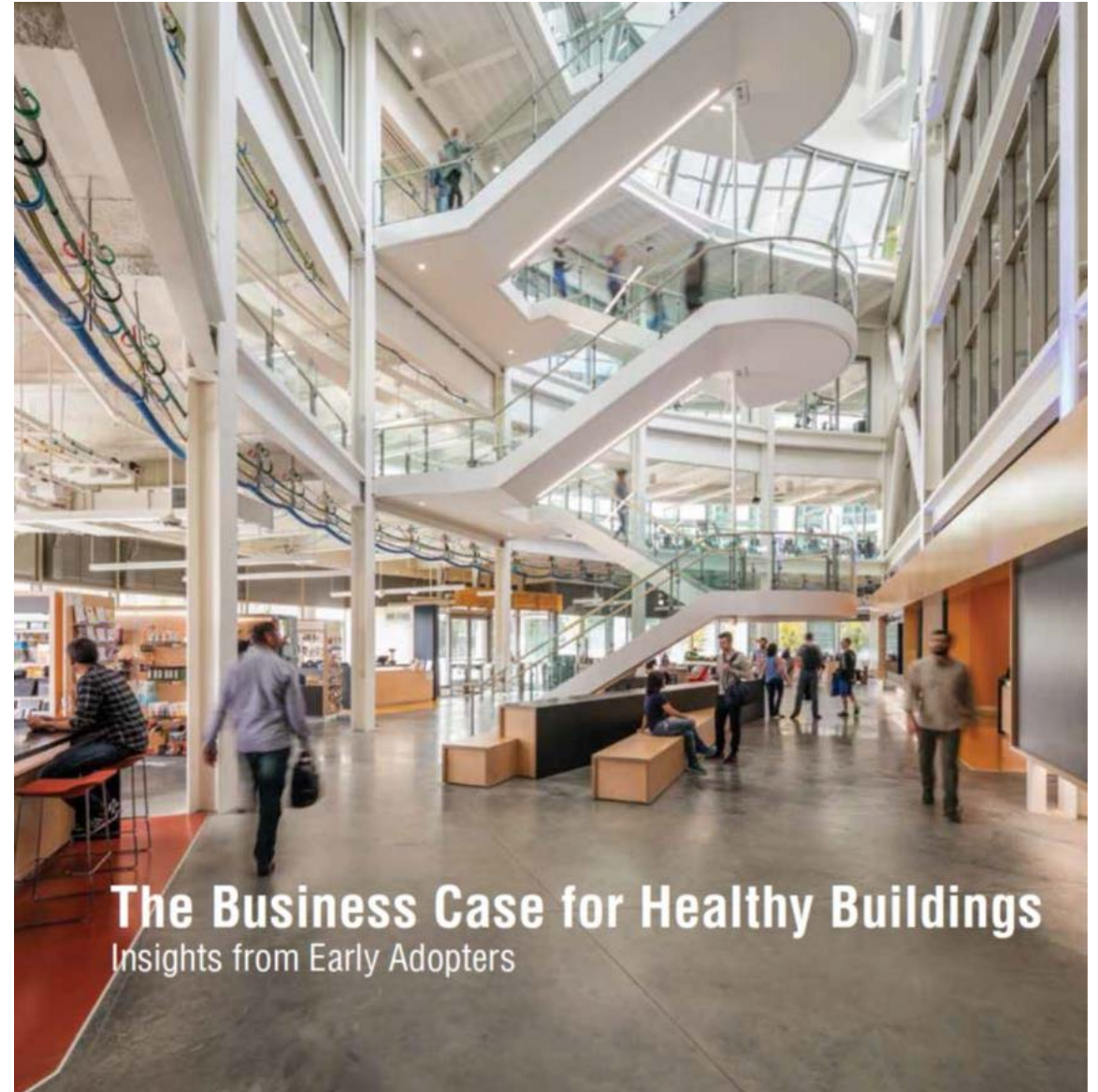
Right now, the answer to all of these questions is “maybe”, “not sure”, and “we hope so”...

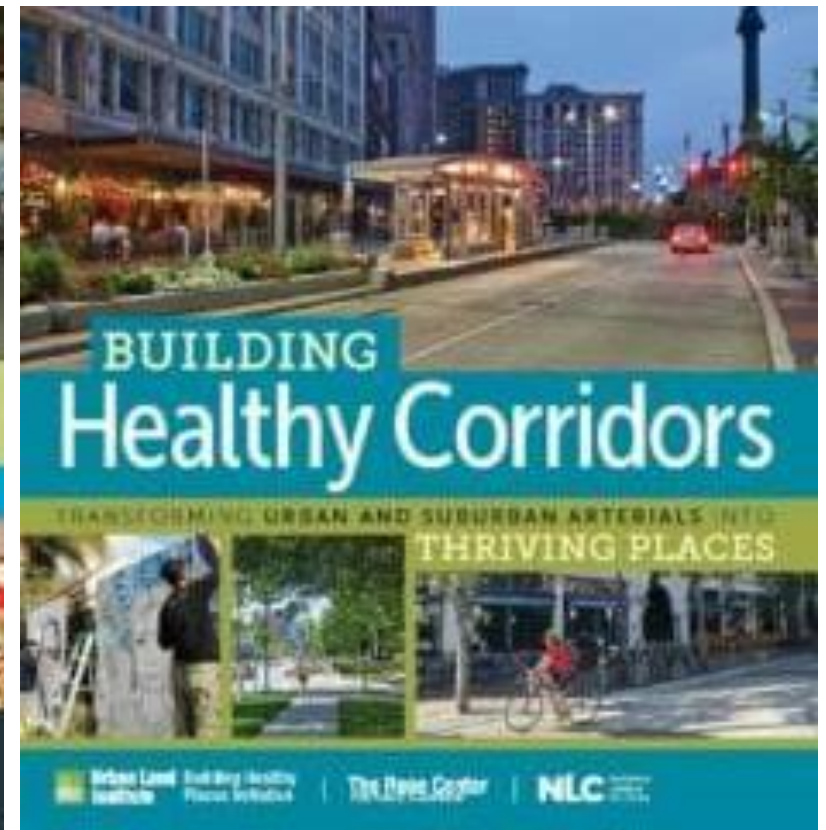
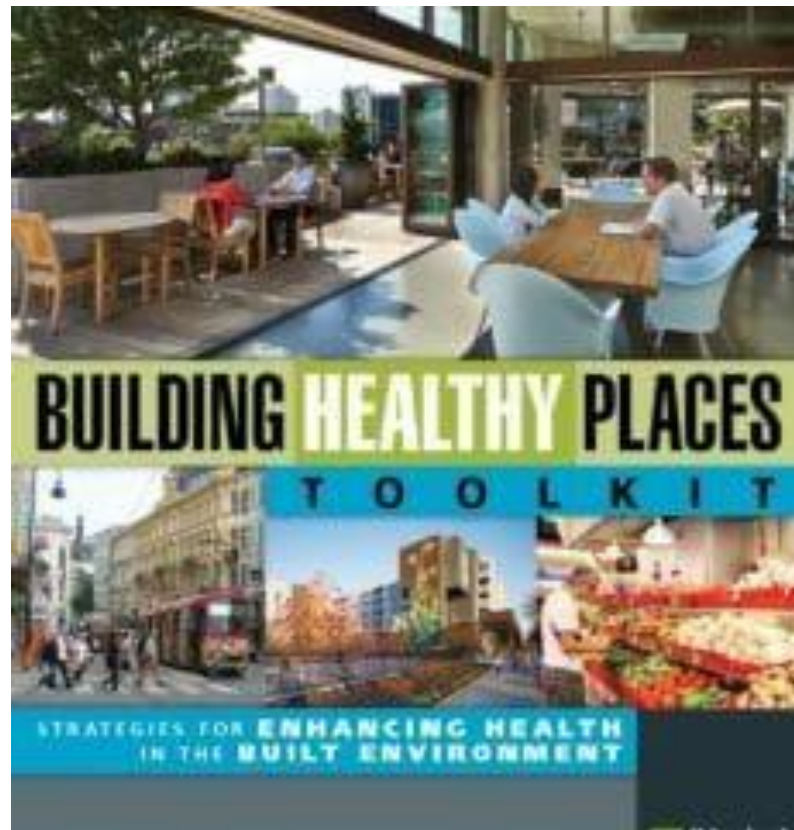
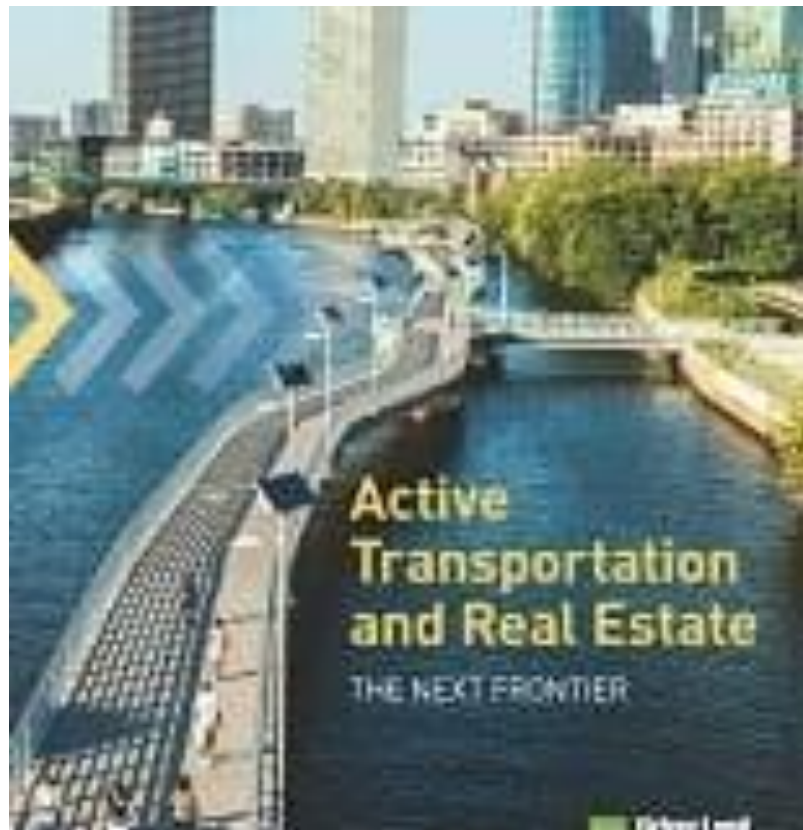
So why should I do this?

- **Market differentiation** –be a leader in a growing tenant trend.
- **Avoid future obsolescence** – “healthy-ready” buildings can avoid costly future retrofits, if healthy becomes standard for “good”
- Like “green”, “healthy” can be synonymous with “well managed”, which helps reduce operating expenses and maintenance issues (which contributes to NOI).
- **There IS a strong business case for tenants** to pay more in rent for a healthy building
- **Lower capital costs and more access to capital?** New debt products may incentivize healthy homes, and institutional investors may start showing preference for healthy offices and other assets.

Building the business case for healthy buildings

- Case studies and profiles from CBRE, Arup, Genentech, Kilroy, Tower, and others on how a healthy-certified building is helping reduce operating expenses, boost revenue, and improve tenant satisfaction.
- New research supporting the business case for healthy-certified buildings.
- A market update on WELL and Fitwel – their market penetration and expanding certification programs.





From Healthy Buildings to Healthy Communities

DISCUSSION: BUSINESS CASE FOR WELLNESS

Are you buying this business case? What do you think about healthy buildings and your markets?

What is needed to drive healthy buildings at scale?

What do you see as current barriers to market adoption, and what can ULI do to address them?

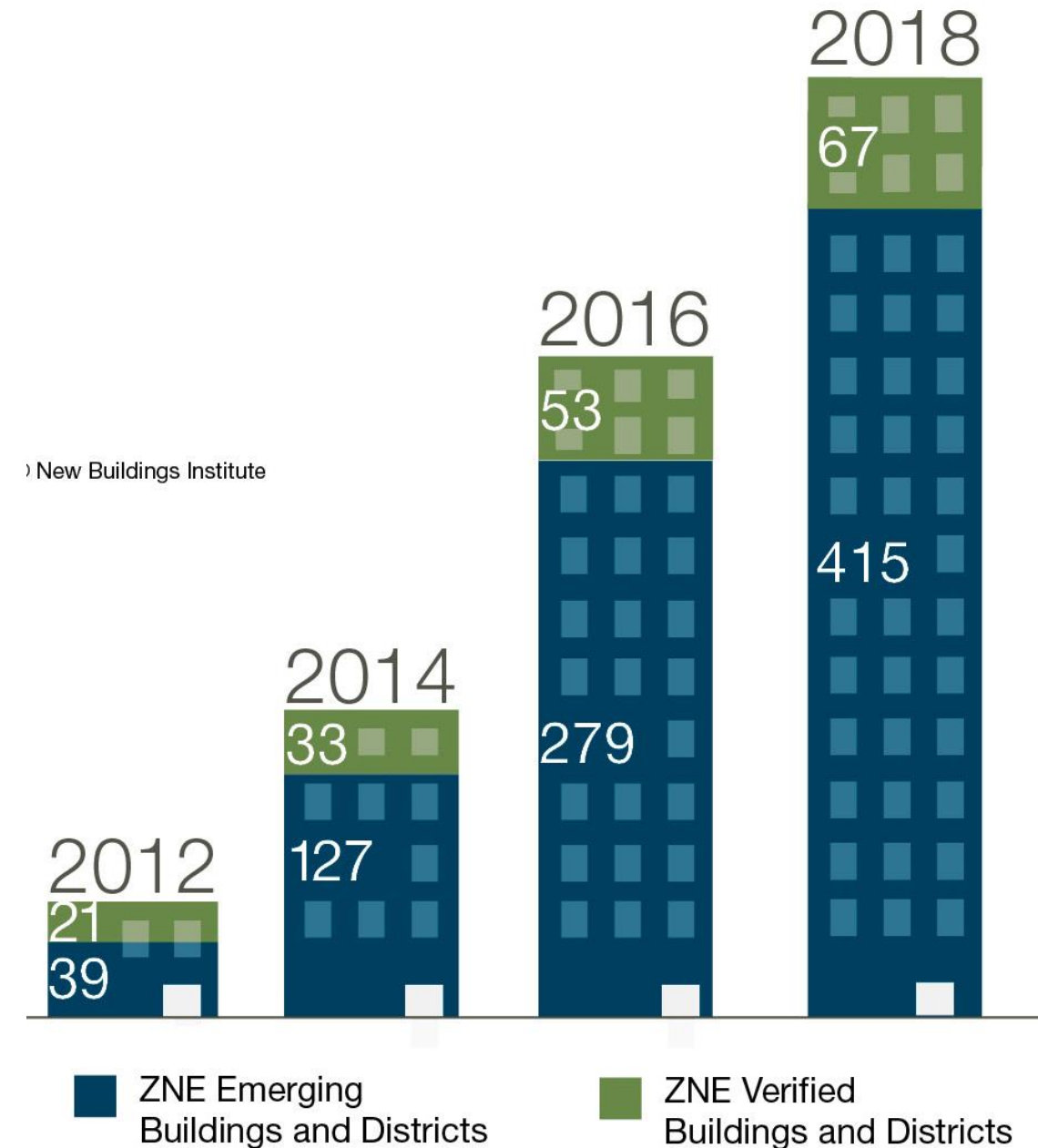
A dark, grayscale background image showing several hands in business attire holding pens and pointing at documents on a table, suggesting a collaborative meeting or presentation.

Part 2

Building a business case for zero net energy

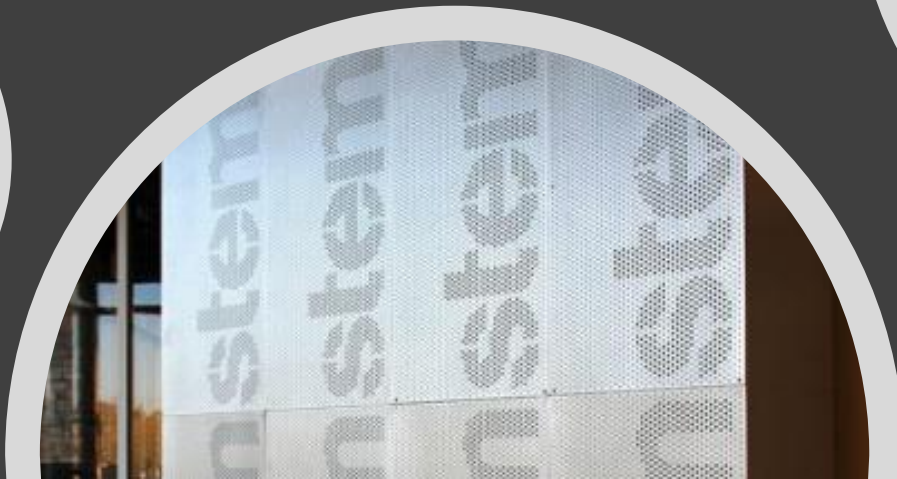
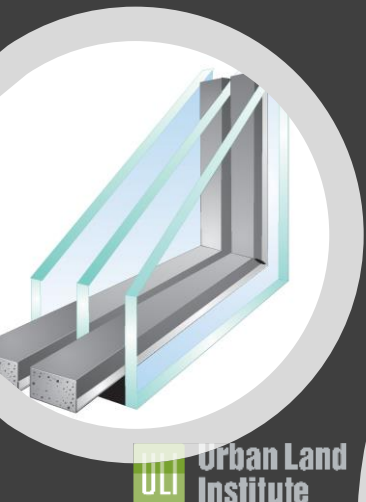
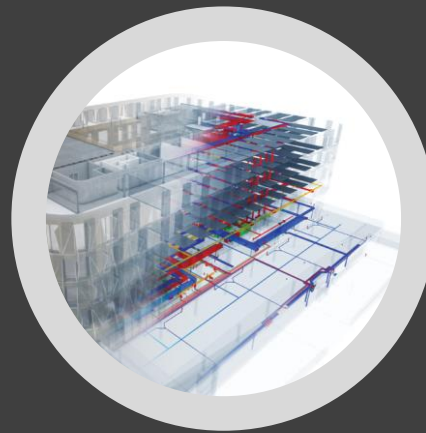
Why “Zero net energy”?

- Energy expenses continue to rise
- The cost of building components to achieve NZE continues to fall
- More countries and regions moving towards ZNE over time (as code!)
- More RE capital looking for the most sustainable property investments, and NZE is the most “future-proofed”.
- New financial tools to sweeten the business case, including off balance-sheet financing, and innovative ZNE leasing.



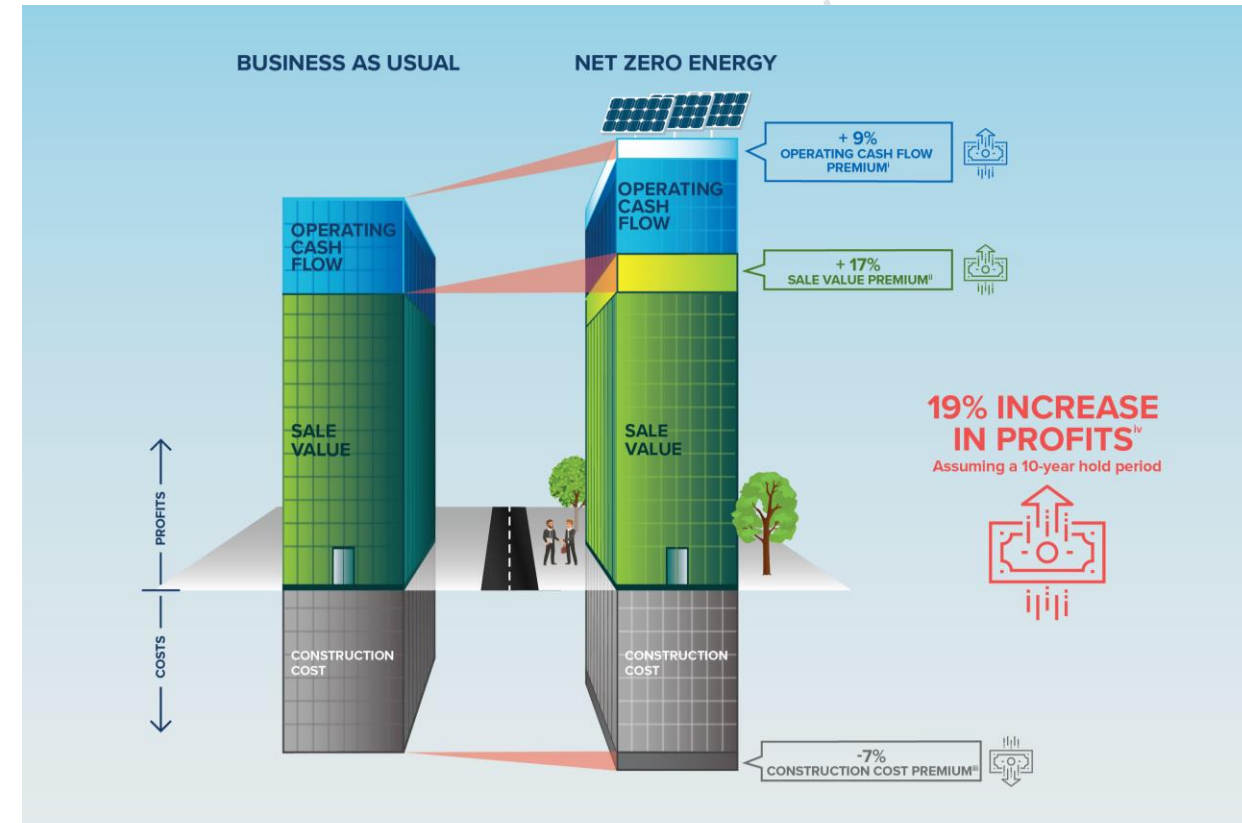
Next-gen materials and technology making ZNE possible

- **New materials:** Structural insulated panels, cross-laminated timber, R-5+ windows
- **New energy management tools:** microsensors, AI-assisted BIM/BMS, energy storage, advanced controls
- **New on-site renewable options** (solar pavers, curtainwall, films, and roof-integrated PV)



Example 1 – new construction, class A commercial spec office building

- Super tight building envelope
 - Mechanical equipment sized for energy efficient tenants
 - Plug load “diet”?
 - Advanced building controls
 - Leveraging all cost-effective renewables available (solar, wind, geothermal, sewer gas?)
 - Working with tenant/future owner to price in value of \$0 in energy costs
-
- 7% premium in construction cost (\$18/SF)
 - \$2/SF/yr rent premium, reduced non-recoverable OPEX generates 18%IRR
 - Future-proofing? NZE Required for NC in CA by 2020/2030, will soon be in Seattle, NYC, and DC.



WHAT BRINGS TENANTS IN AND MAKES THEM WANT TO STAY?



Better
daylight
& views



Improved
indoor
air quality



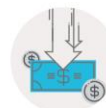
Better
thermal
comfort



Bolstered
employee
recruitment
& retention



Improved
employee
satisfaction &
productivity



Lower
operating
costs

Example 2 – 82,408 SF Manufacturing Building, gut rehab

1) Reduce EUI

- LED Lights
- Optimized HVAC Tune-Up
- Insulation
- Window Film
- Reflective Insulated Roof

2) Generation

- Rooftop Solar
- Parking lot Canopies
- 1.02 MW System
- Generates > 1.6 MM kWh/yr.



Economic Results

ROI for the Building Owner:

- Total Investment Cost: \$3,332,988
- Less tax Incentives \$1,366,535
- Net Cost after Year 1: \$1,966,453
- Annual Utility Savings: \$421,000
- Return on Net Cost: 21.4%
- Simple payback (years): 4.67
- Increased Building Value: \$6,415,385

Benefits to Manufacturing Tenant:

- Cost of Power set at \$0 for next 20 years
- Competitive advantage when pricing L-T contracts
- Increased Profits (lower future power costs)
- Reduced maintenance costs (roof, lights, HVAC)

Benefits to the Environment:

- Offsets the burning of over 95 Million Gallons of Gasoline over a 20 year period.



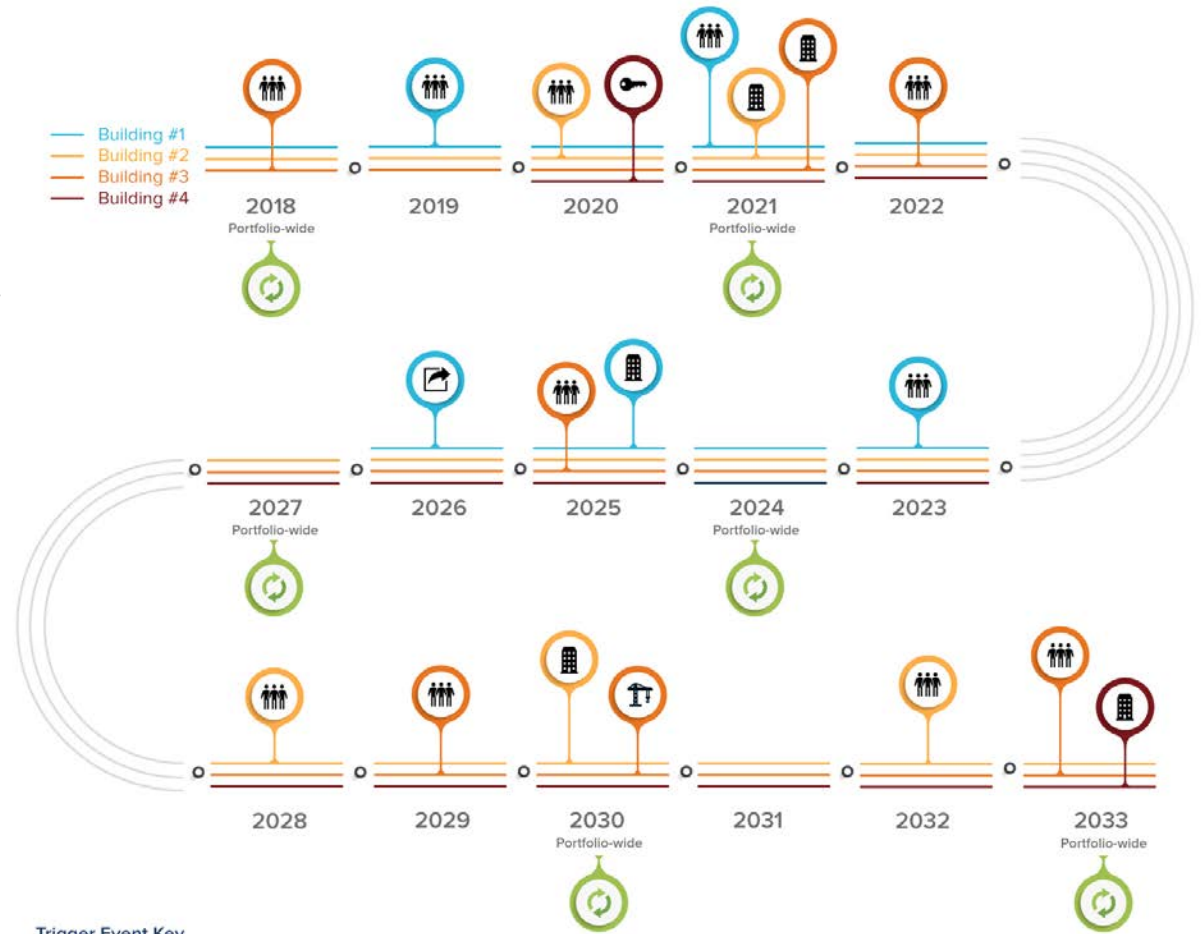
Zero over time – for a district, or a building portfolio?

Existing buildings

- Baseline, Benchmark, set goals
- Low/no cost improvement: facility management and tenant engagement
- Quick payback investments (lighting, lighting controls, insulation, metering for efficiency?)
- Long-term high-ROI opportunities – roof, mechanical systems, on-site renewables and storage?
- Have to overcome split incentives – owner/tenant, owner/property manager, owner/investor.

For a district?

- Renewable and low-carbon power
- Shared renewable resources from distributed generation
- Customized incentives for efficiency, demand management, and renewables



Trigger Event Key



Lease Turnover or Renewal

Actions to Consider

- Green lease language
- Adjust energy charge based on lease structure
- Plug load budget
- Tenant energy feedback
- Low/no-cost cost ECMs
- HVAC reconfiguration or envelope upgrades



Major Equipment Replacement

Actions to Consider

- Replace major HVAC or water heating equipment
- Add roof and insulation
- High-performance windows
- Replace fossil fuel gensets with electric and thermal storage
- Fuel switching from gas to electric



New Building Entering Portfolio

Actions to Consider

- Standardize property condition report to include energy audit and functional performance tests
- Evaluate all "actions to consider" for lease turnover and major equipment replacement trigger events



Building Leaving Portfolio

Actions to Consider

- Include energy information in statement of value
- Standardize property conditions report to include energy audit and functional performance tests
- Provide energy one-page summary to agents and prospective buyers



New Construction or Major Renovation Project

Actions to Consider

- Design all new construction to NZE (or NZE-ready)
- Consider systems like ground source heat pumps
- Design roofs to handle on-site solar PV



Regular Energy Checkups

Actions to Consider

- Continuously:
- Tenant engagement
- Commissioning
- Every three years:
- Assess new utility rates
- Reconsider solar PV and energy storage

Q&A

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