



Building 4 People: Health, Wellbeing & Productivity in Europe

*Multiple Benefits Workshop
Serock, Poland
June 13-16, 2018*



WE ARE A NON-PROFIT PLATFORM PROMOTING HEALTHY AND SUSTAINABLE BUILDINGS

Given that we spend **90%** of our time in buildings, let's put **people at the center** of building design, operation and management.

THE THREE Cs

COORDINATION

Aggregating People and Knowledge

COMMUNICATION

Promoting **Building4People**

COMMITMENT

Elevating Leaders



WE WORK WITH PARTNERS COMMITTED TO
ELEVATING HEALTH, WELLBEING AND
PRODUCTIVITY OF PEOPLE LIVING, WORKING
AND STUDYING IN BUILDINGS.





Building 4 People: Key Parameters that influence Health, Wellbeing and Productivity



Temperature

reflecting the basic human need for protection from extremes of temperature



Light

pointing to the need for adequate workspace lighting and the effect of light on wellbeing



Air

demonstrating the needs for clean, healthy air, free from harmful pollutants – many of which cannot be directly sensed, but can nevertheless cause serious health effects



Noise

showing that noise can be extremely disruptive, damage our hearing or cause distress, anxiety, hindered communication and reduced concentration

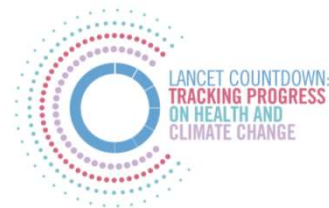
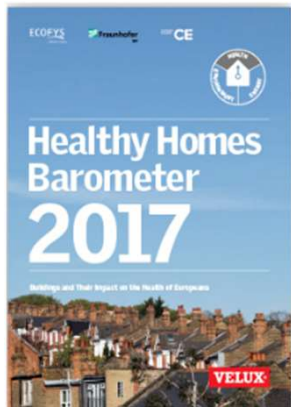
These four foundations impact the overarching outcome goal of:
Health, Wellbeing and Productivity



Download the White Paper:
www.buildings2030.com/whitepaper



Building 4 People: Key Influencers





Buildings in Context

40%

energy
consumed by
buildings

90%

Time is spent
in buildings

36%

of carbon
emissions come
from buildings

35%

of buildings are
over 50 years
old

97%

of buildings in
the EU need an
upgrade

Heathy Buildings in EU Policy

There is no clear champion
within the European Commission
and the issues are not well-addressed and resourced

A photograph of a modern, two-story house with a dark blue roof and white siding. The house features a large two-car garage with grey doors and a teal front door. The house is illuminated from within, and the driveway is wet, reflecting the lights. A semi-transparent blue box with white text is overlaid on the upper portion of the image.

**The current renovation rate of 1%
needs to be increased to 3% to meet
2050 goals.**


World GBC: “To achieve the 100% net zero carbon by 2050, renovation rates must increase to 3% per year if we start in 2017, or higher if we start later.”



A photograph of a European city street, likely in Vienna, featuring a green and white tram on tracks. The street is lined with historic buildings and trees with yellow autumn leaves. A blue semi-transparent box is overlaid on the upper half of the image, containing white text. The ground is covered with fallen leaves, and a few pedestrians are visible on the sidewalks.

97% of European buildings need to be upgraded

Source: BPIE

A low-angle, upward-looking photograph of several modern multi-story buildings. The buildings feature large windows and balconies, with some having curved architectural elements. The sky is a clear, pale blue. A semi-transparent blue rectangular box is centered over the image, containing white text.

**People
do not buy energy efficiency**

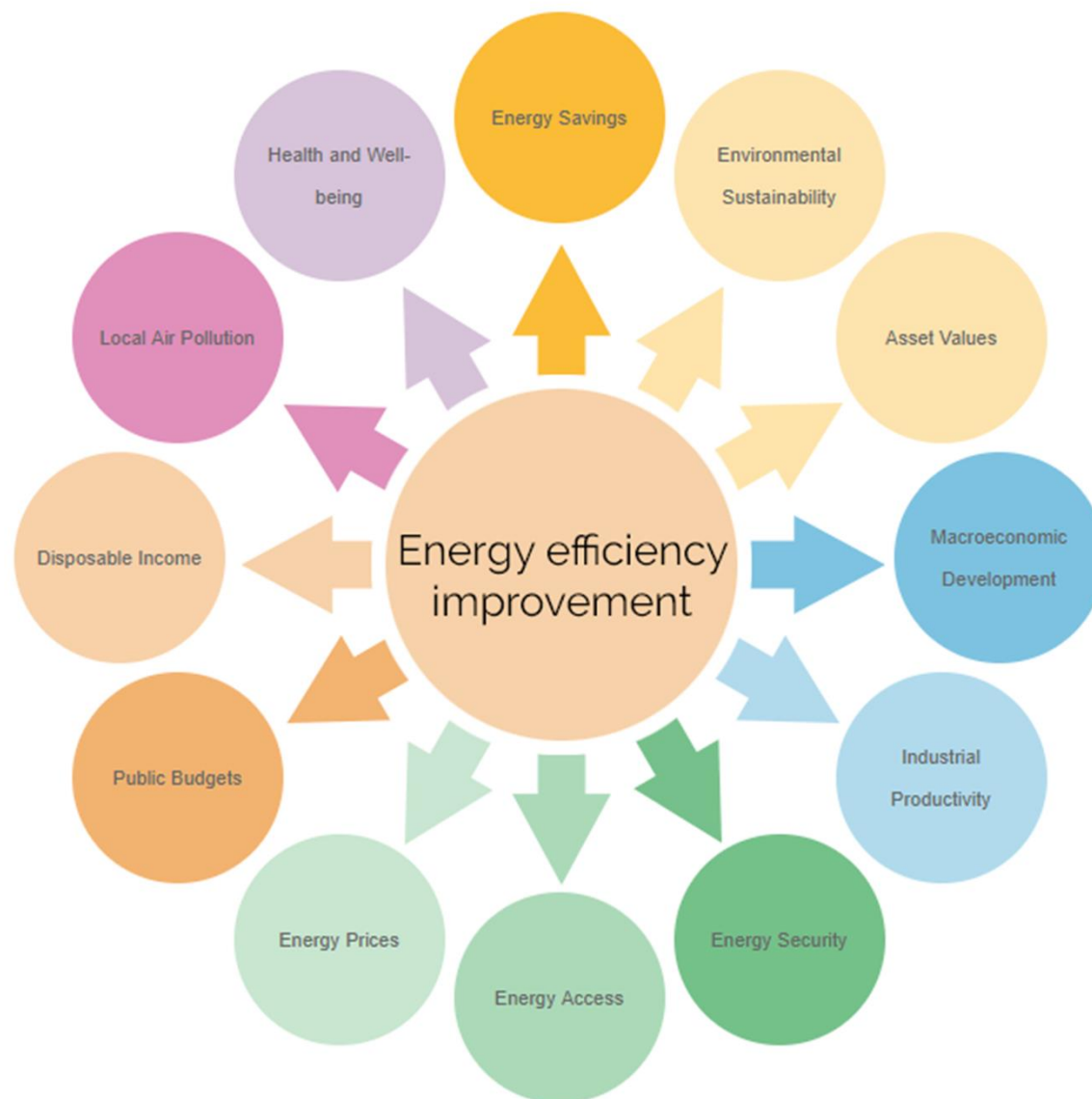
**People are motivated by comfort,
health considerations and cost
savings**



The Multiple Benefits Discussion is not new

Unfortunately, there is a lack of clear definition of **multiple benefits** of energy efficiency. These benefits have been called “**green**”, **social**, **non-energy** or **co-benefits**.

Health, wellbeing and productivity benefits are rarely quantified and properly accounted for during a building renovation.



On the market

DATA COLLECTORS



CERTIFICATION STANDARDS



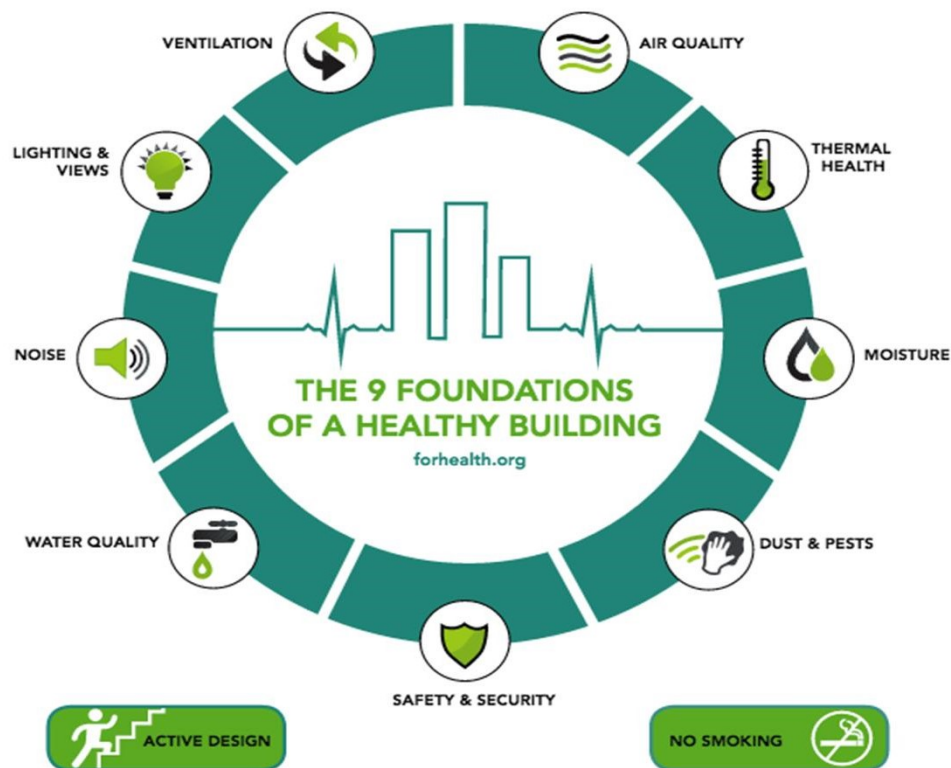
...related to health and well-being in buildings





Pr J. Allen (Harvard): “Green buildings bring nearly \$6 billion in combined health and climate benefits.”

THE 9 FOUNDATIONS OF A HEALTHY BUILDING



IN THE U.S., GREEN BUILDINGS PREVENTED:



Better Places for People

EIGHT FEATURES THAT MAKE HEALTHIER AND GREENER OFFICES

1. INDOOR AIR QUALITY & VENTILATION

Healthy offices have low concentrations of CO₂, VOCs 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 workspaces help 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 had 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

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.⁸

EMPLOYEE ENGAGEMENT



Healthy offices have employees that are regularly consulted and that feedback is used to drive continuous improvement.⁹

Case study - CETEC

ASSESSING HEALTH & WELLBEING OF STAFF AND STUDENTS IN THE ROSE BOWL, LEEDS BECKETT UNIVERSITY

Paul Ajiboye¹, Vyt Garnys¹, David Hemming²

¹ CETEC Foray (UK) Ltd, ² Leeds Beckett University (presently, Houses of Parliament)



Fig. 1: The Rose Bowl

CLASSROOM 525			
CO ₂	CO	TVOC	Form.
PM ₁₀	PM _{2.5}	O ₃	°C
RH	Air sp	dB	lux

OFFICE 404			
CO ₂	CO	TVOC	Form.
PM ₁₀	PM _{2.5}	O ₃	°C
RH	Air sp	dB	lux

Level 5



CLASSROOM 513			
CO ₂	CO	TVOC	Form.
PM ₁₀	PM _{2.5}	O ₃	°C
RH	Air sp	dB	lux

OFFICE 421

1. INTRODUCTION:

In February 2017 an assessment of the Indoor Environment Quality (IEQ) was undertaken in the Rose Bowl building to see how it was performing for occupants against the claim that the BREEAM Excellent rated building had been designed with wellbeing in mind.

The National Australian Built Environment Rating Scheme (NABERS) was used as the relatively low-cost, high standard assessment approach. It was also chosen as it is an independent Government owned scheme that has been around for about 10 years.

As part of the NABERS assessment occupants were asked to complete a satisfaction survey.

Health
criteria

Comfort
criteria

Table 1: International benchmarks for IEQ	
Parameter	Guideline Limit or range (refs)
Carbon monoxide (CO)	9ppm (NABERS/LEED/WELL/WHO)
TVOC	500µg/m ³ (NABERS/LEED/WELL)
Formaldehyde	100µg/m ³ (NABERS/WHO)
Particulates, PM ₁₀	50µg/m ³ PM ₁₀ (NABERS/LEED/WELL)
Particulates, PM _{2.5}	15µg/m ³ PM _{2.5} (LEED/WELL)
Ozone (O ₃)	80ppb (LEED/NEPM)
Carbon dioxide (CO ₂)	1000ppm (ASHRAE)
Temperature °C	21-24°C (ASHRAE)
Relative Humidity %	30-70% (ASHRAE)
Air speed	<0.2m/s (NABERS)
Acoustic comfort	35-45dB (NABERS)
Lighting	Horizontal >320 lux / vertical >180 lux (AS1680)

2. METHODOLOGY:

Classrooms, offices and a lecture theatre were all analysed to give a representation of the different uses of space within the building.

Measurements were taken using calibrated scientific instruments over one day during the morning and afternoon.



EU projects with CEE focus

<https://combi-project.eu/>



All EU 28

<http://embuild.eu/>




Ger, Romania, Cro, Slo, Srb

<http://reach-energy.eu/>



BG, Slo, Mcd, Cro

A low-angle, upward-looking photograph of several modern multi-story buildings. The buildings feature large windows and balconies, with some having curved architectural elements. The sky is visible at the top of the frame. A semi-transparent blue rectangular box is centered over the image, containing white and green text.

We need to build a
community dedicated to
Building 4 People



1

Health Data



2

**Financial
Modelling**



3

**Market
opportunity**

Building 4 People Community

**Academic
experts**




**Private
sector
experts**



**Reps of
European
and Int.
Orgs**



**Voluntary
Commitment
from Private
Sector**



Building 4 People

Healthy, energy efficient and
smart buildings

Thank you!

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