BUILDINGS 2030

Building 4 People:
Health, Wellbeing & Productivity in Europe

Multiple Benefits Workshop
Paris, France
March 5 – 7, 2018

iea International Energy Agency

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.

European Climate Foundation

INTERNATIONAL WELL BUILDING INSTITUTE™

HEAL

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

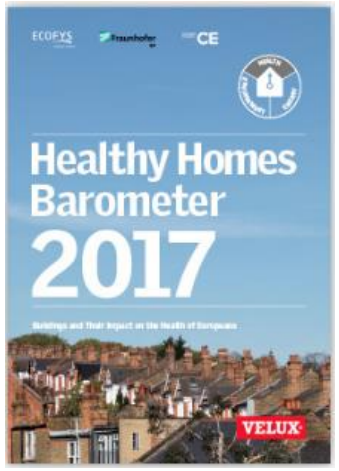
Building 4 People: Key Influencers

BETTER PLACES FOR PEOPLE | PUT WELLBEING AT THE HEART OF YOUR BUILDING

BBP BETTER BUILDINGS PARTNERSHIP

ULI

GRESB



INTERNATIONAL WELL BUILDING INSTITUTE™

TU Delft
Delft University of Technology

HARVARD T.H. CHAN SCHOOL OF PUBLIC HEALTH

comfort meter
Building Performance

GOOD DAY AT WORK
POWERED BY robertsoncooper

UK IEG
Indoor Environments Group

bre

lightingforpeople

RESET STANDARD
HEALTHY BUILDINGS

LANCET COUNTDOWN: TRACKING PROGRESS ON HEALTH AND CLIMATE CHANGE

Buildings in Context

40%	90%	36%	35%	97%
energy consumed by buildings	Time is spent in buildings	of carbon emissions come from buildings	of buildings are over 50 years old	of buildings in the EU need an upgrade

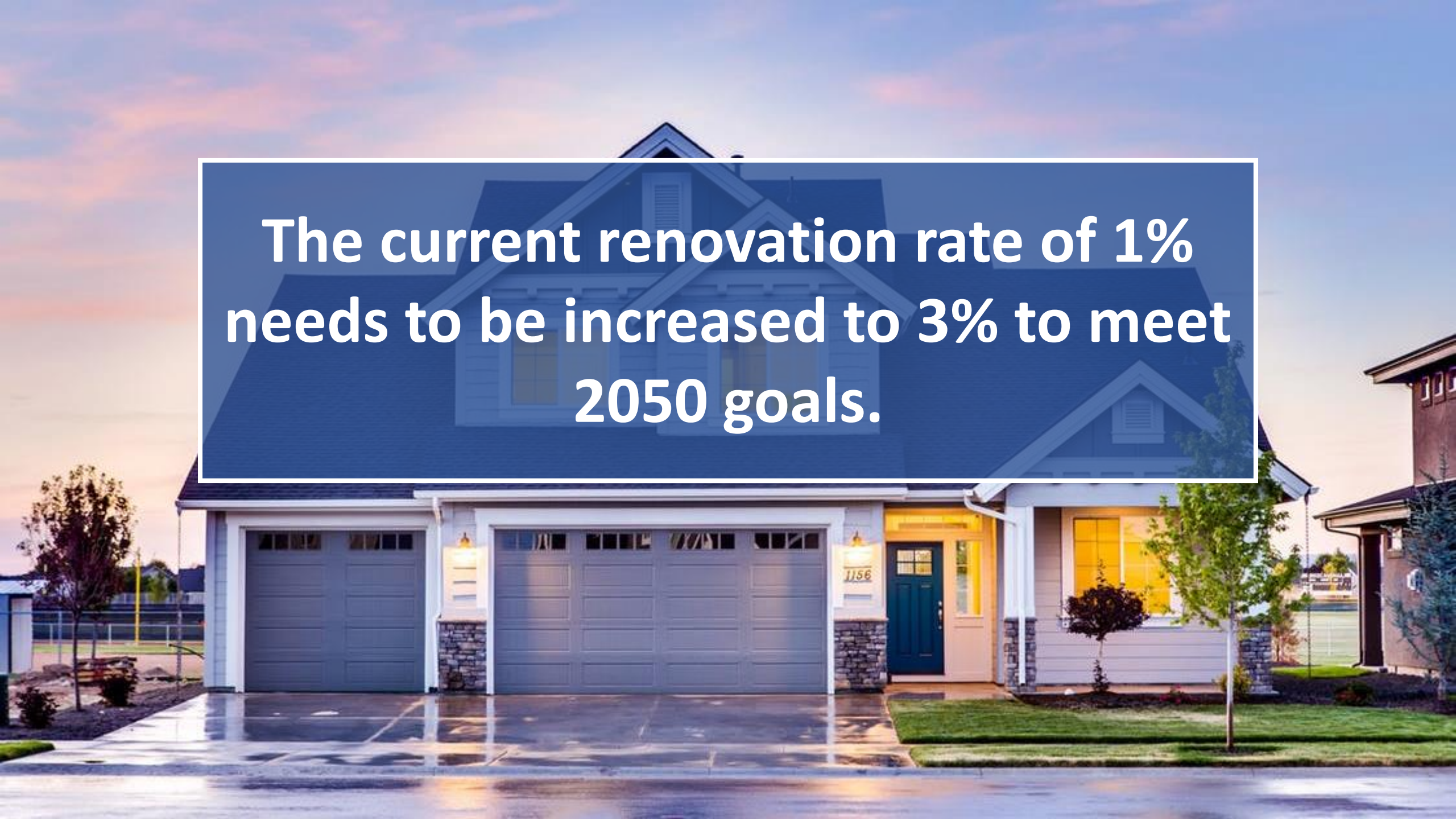
Heathy Buildings in EU Policy

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

BUILDINGS 2030

COP 21 Paris Agreement
Sustainable Development Goals
EU Climate and Energy Targets for 2030.

THERE IS A GLOBAL TREND TOWARDS SUSTAINABLE BUILDINGS


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.”

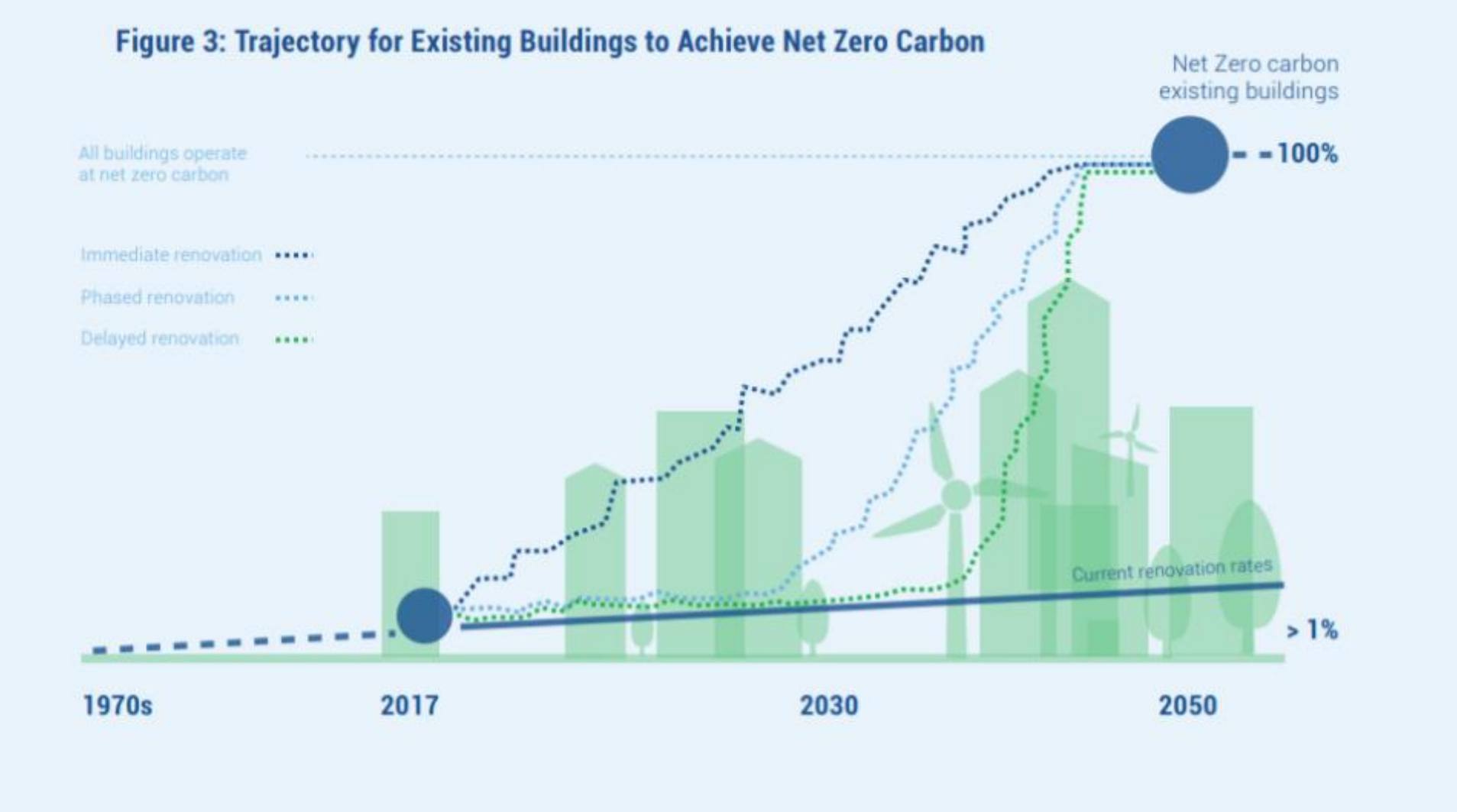
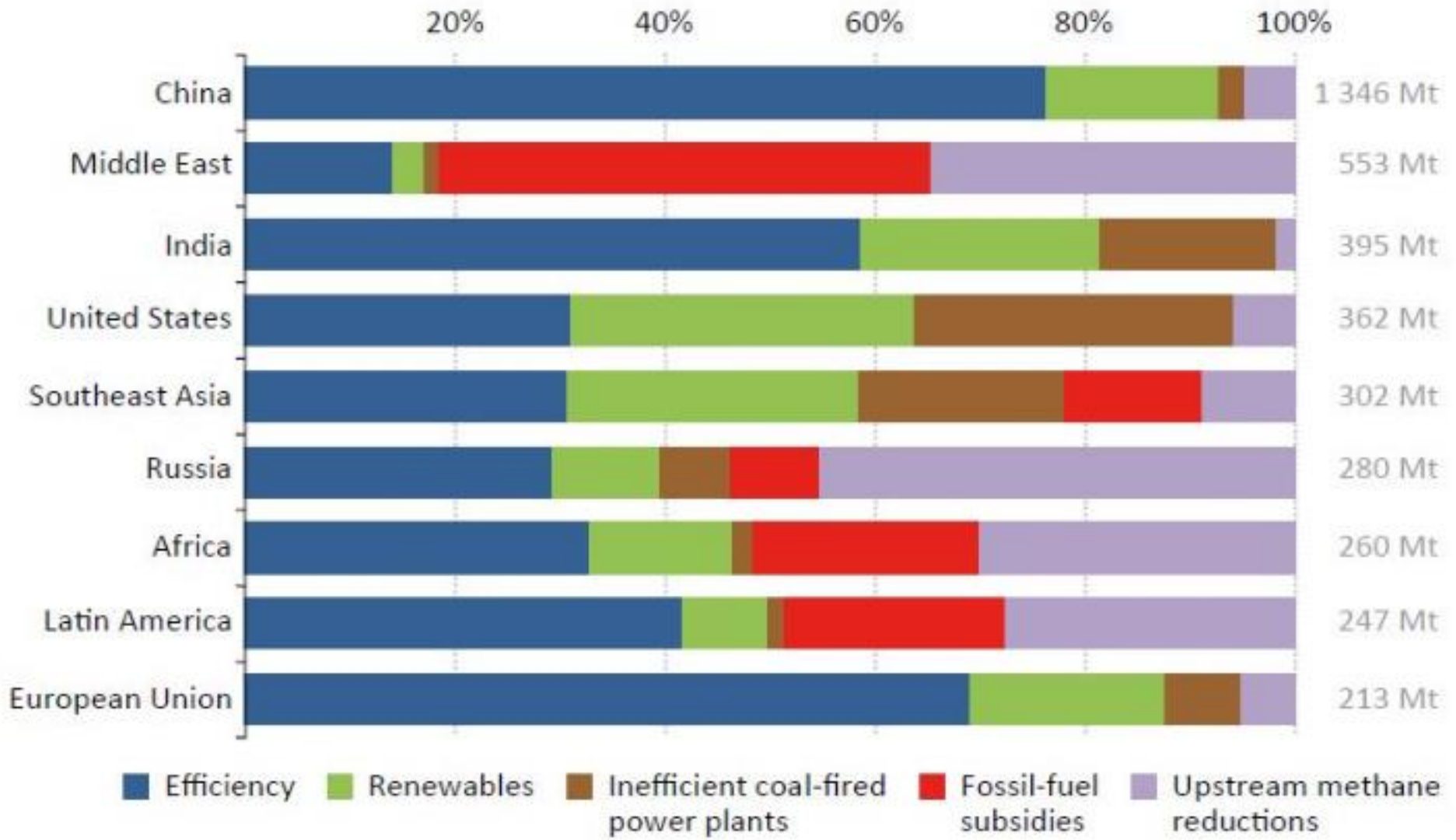


Figure 3.4 ▷ **Energy-related GHG emissions reduction in CO_2-eq terms by policy measure and region in the Bridge Scenario relative to the INDC Scenario, 2030**



97% of European buildings need to be upgraded

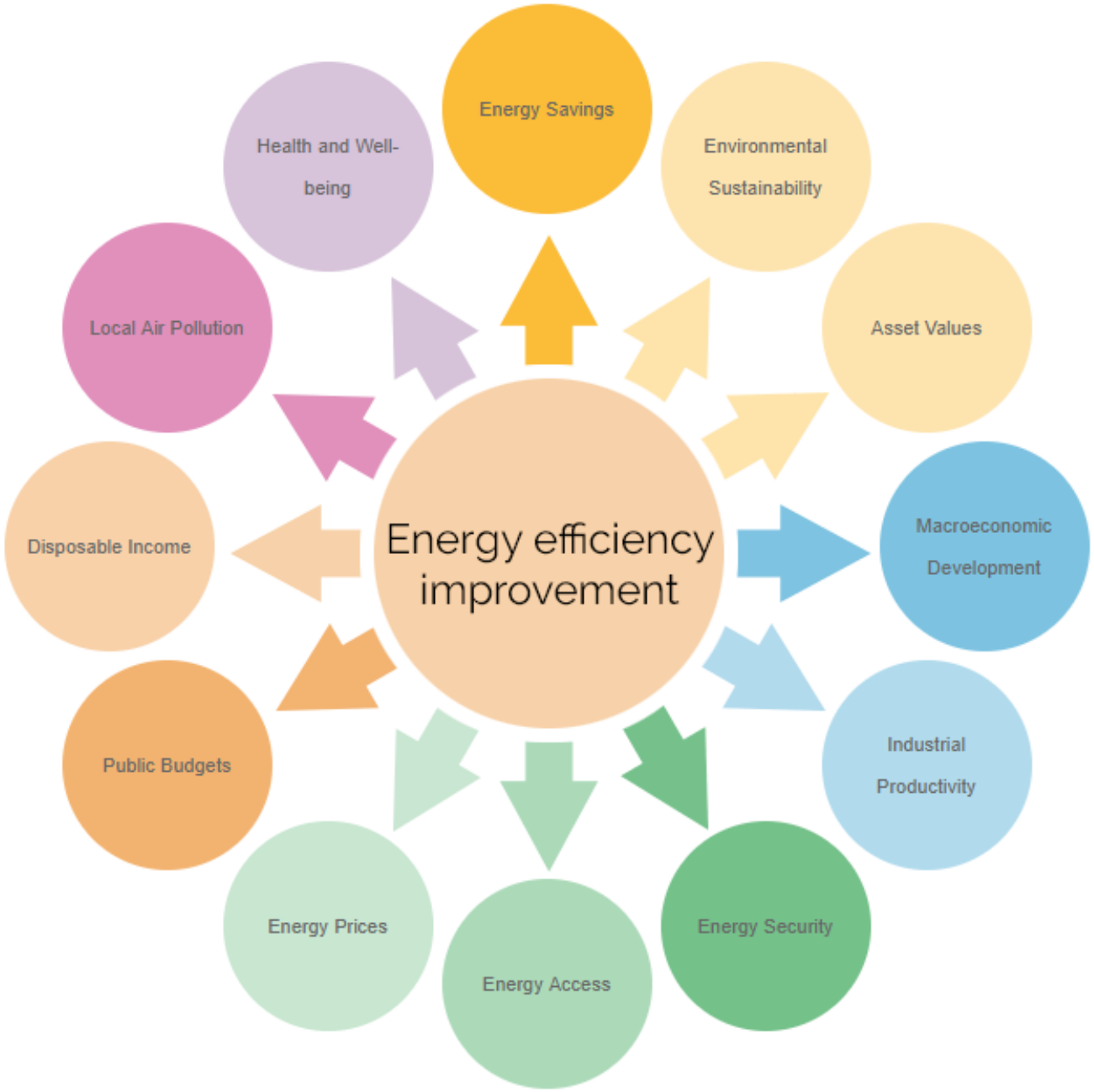
Source: BPIE: http://bpie.eu/publication/97-of-buildings-in-the-eu-need-to-be-upgraded/


People do not buy energy efficiency.
People are motivated by comfort, health considerations and sometimes savings.

The Multiple Benefits Discussion is not new

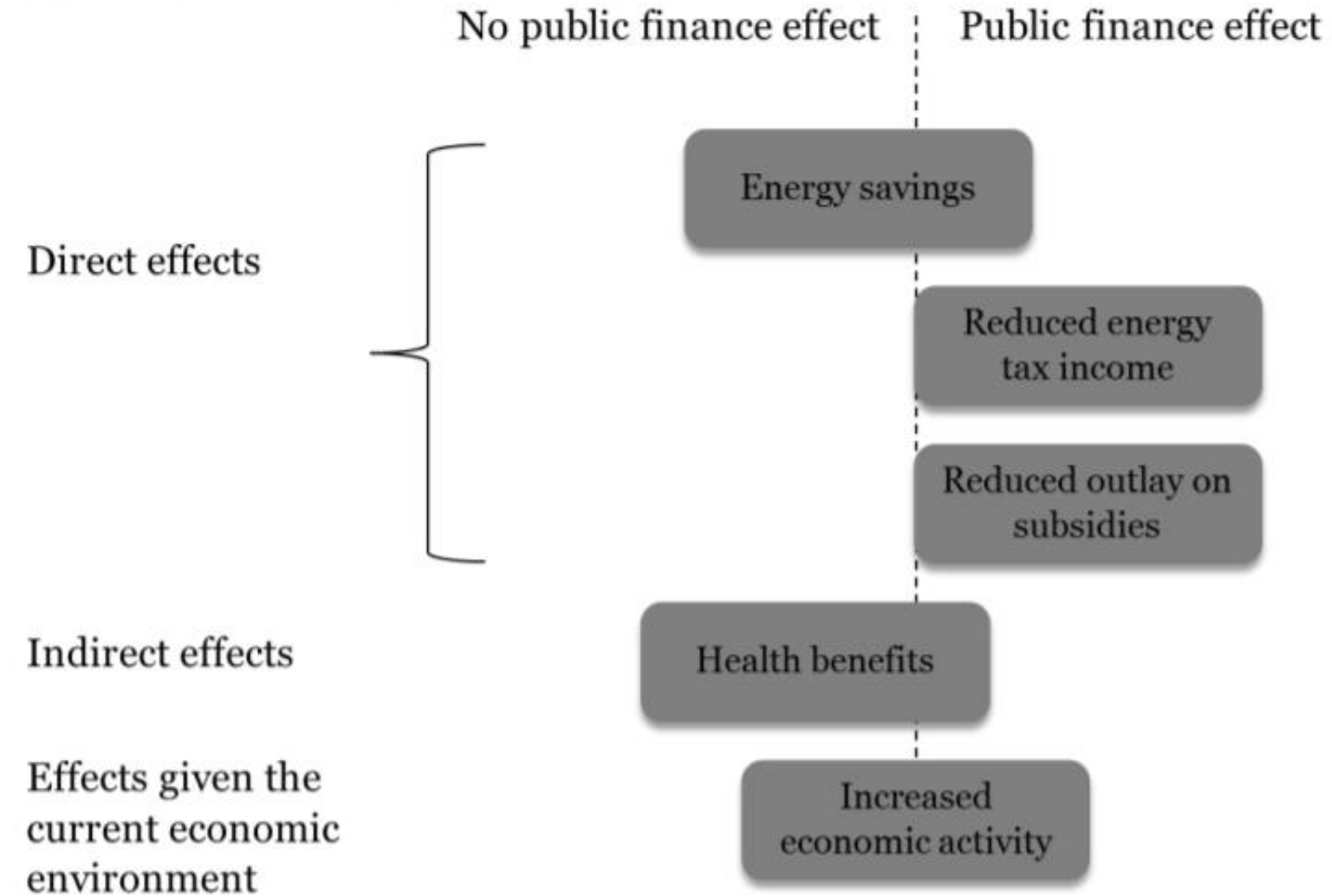
Unfortunately, there is a lack of clear definition of **multiple benefits** of energy efficiency. These benefits have been called **“green”, social, non-energy or co-benefits.**

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


Energy efficiency improvement
Energy Savings
Environmental Sustainability
Asset Values
Macroeconomic Development
Industrial Productivity
Energy Security
Energy Access
Energy Prices
Public Budgets
Disposable Income
Local Air Pollution
Health and Well-being

Copenhagen Economics CE

Figure 5 Effects of energy efficient renovation of buildings



Source: Copenhagen Economics

Buildings impact on Health

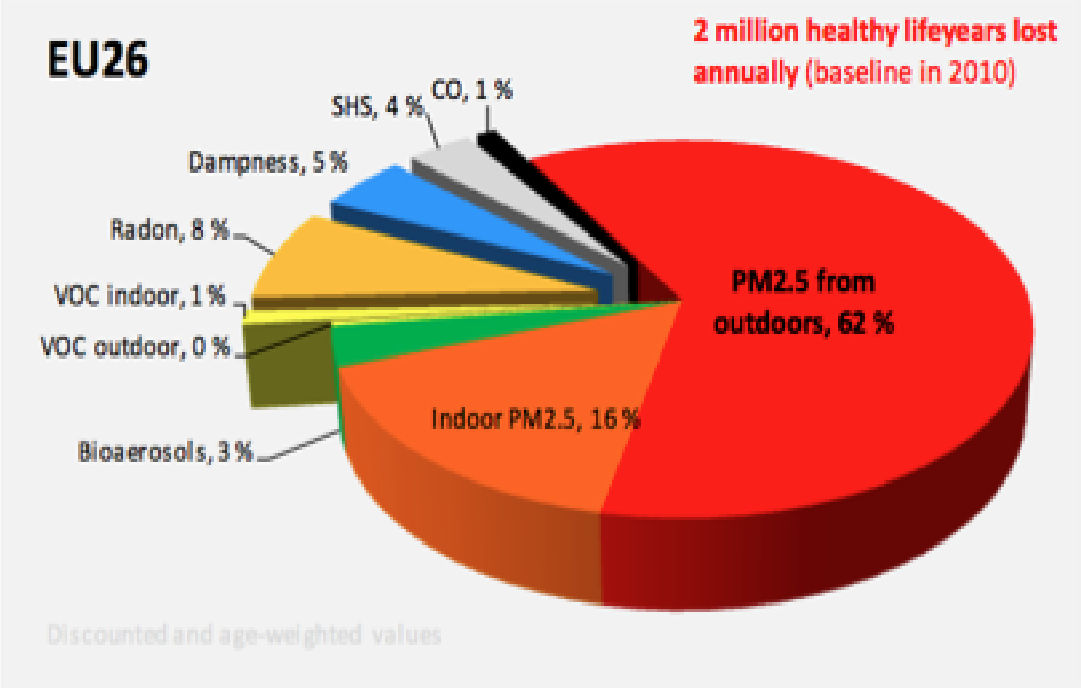


Figure 4.1 The European Commission's DG SANCO funded IAIAQ project estimated that 2 million healthy life years (DALY) are lost annually in EU26 due to indoor exposures to air pollution (baseline year 2010) (Jantunen et al., 2011).

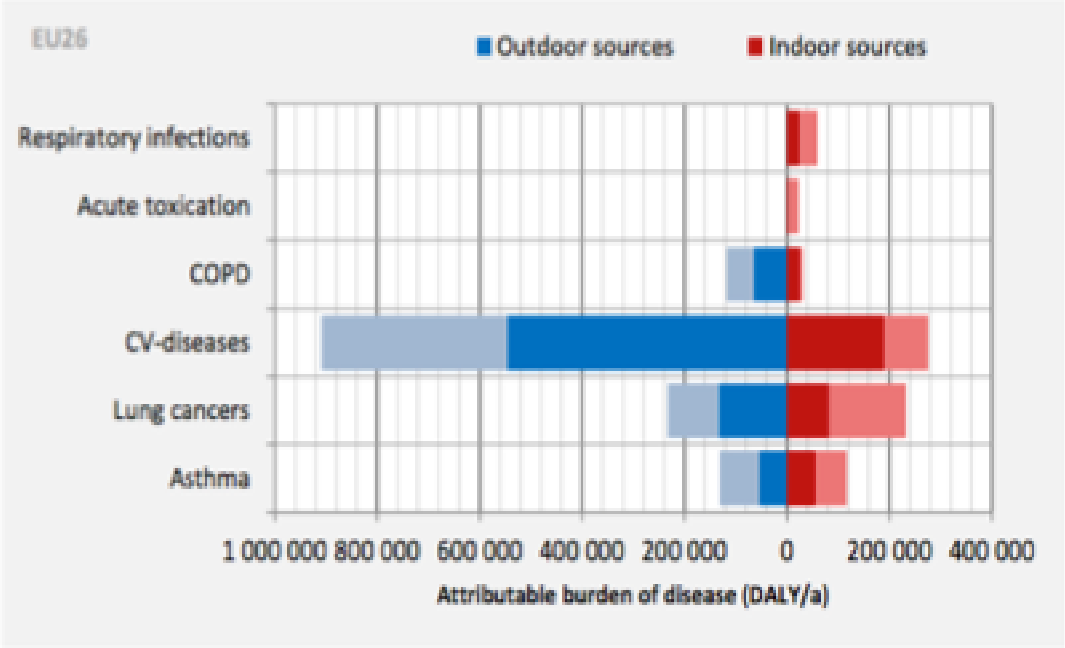
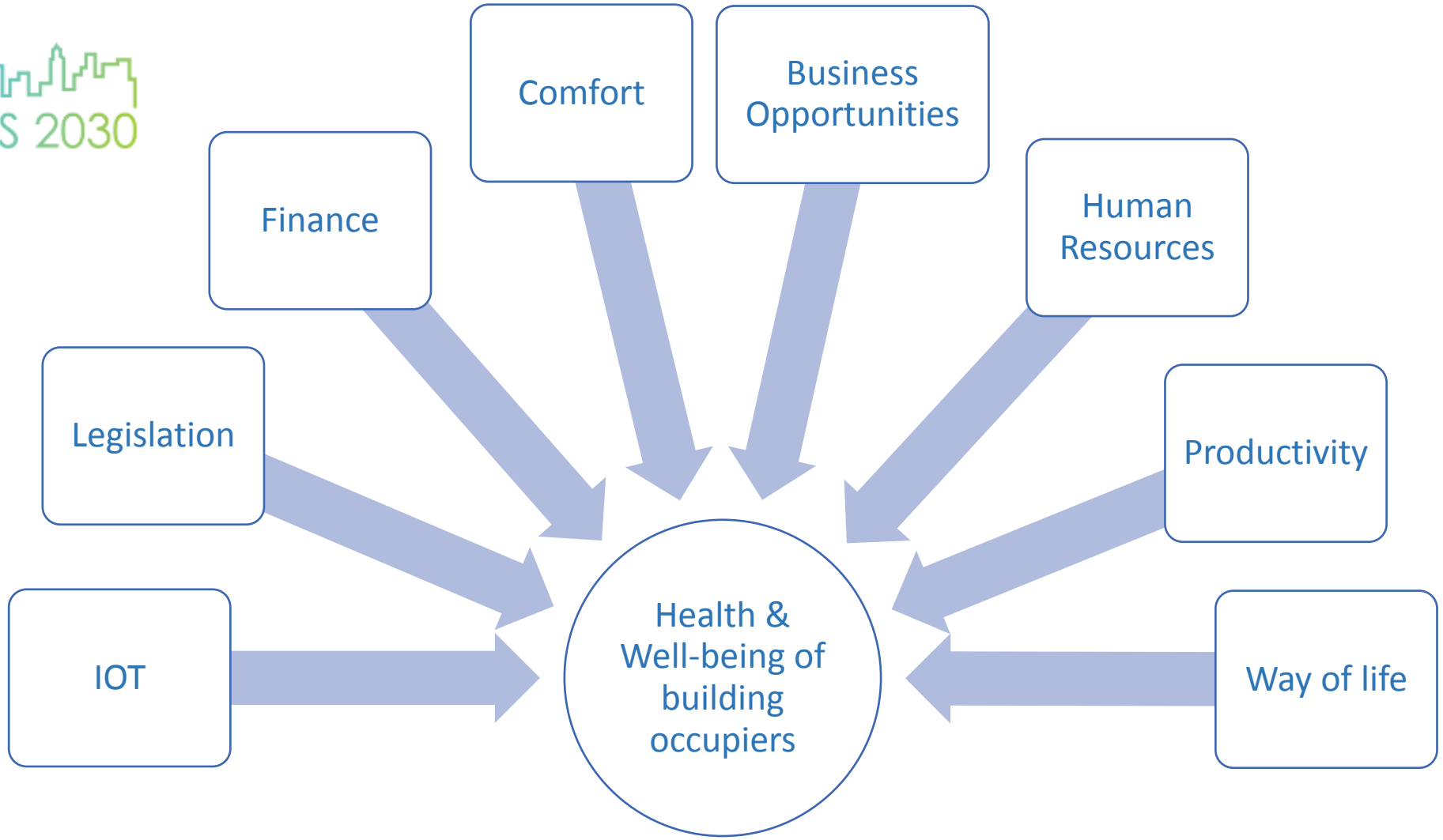


Figure 4.2 The health losses due to inadequate IAQ are dominated by diseases in the cardiovascular and respiratory systems. Substantial fraction of this burden is associated with outdoor air pollution brought indoors via infiltration and ventilation. (Hänninen & Asikainen, 2013)

“92% of people worldwide don’t breath safe air”
Dr. Maria Neira, WHO

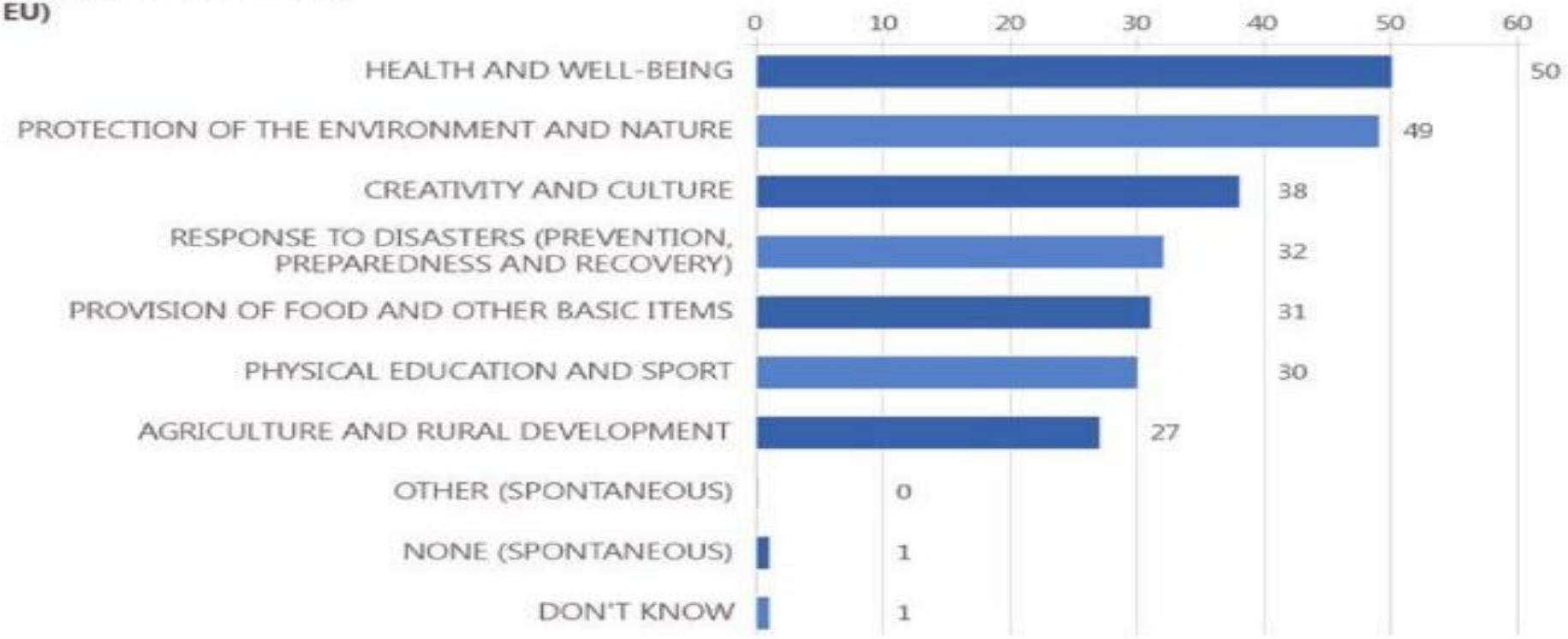
World Health Organization

Trends


Comfort
Business Opportunities
Finance
Human Resources
Legislation
Productivity
IOT
Health & Well-being of building occupiers
Way of life

Trends

Q3 And in which of these other areas do you think that the EU should take action to encourage young people to express solidarity? (MAX. 3 ANSWERS)
(% - EU)



Base: All respondents (N=10,927)

Source: EUROBAROMETER

On the market ….

DATA COLLECTORS

CERTIFICATION STANDARDS

…related to health and well-being in buildings

FOR HEALTH
forhealth.org

INTERNATIONAL WELL BUILDING INSTITUTE
WELL
TM

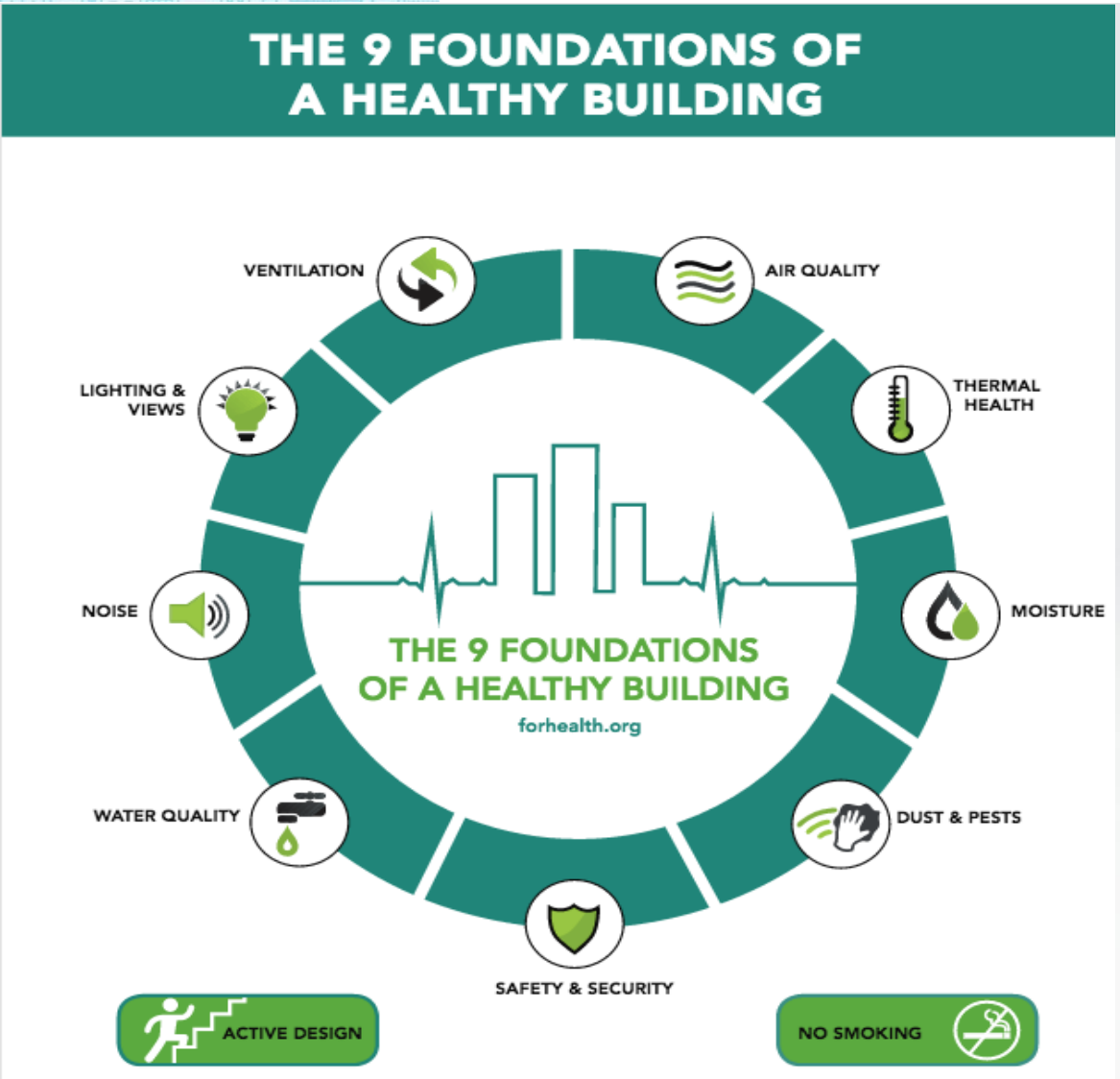
BETTER PLACES FOR PEOPLE
PUT WELLBEING AT THE HEART OF YOUR BUILDING

Osmoz

fitwel®

HEALTHFX
HEALTH CO-BENEFITS OF
GREEN BUILDINGS

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



Better Places for People

EIGHT FEATURES THAT MAKE HEALTHIER AND GREENER OFFICES

1. INDOOR AIR QUALITY & VENTILATION

Healthy offices have low concentrations of CO_2, 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 Ajiboye[1], Vyt Garnys[1], David Hemming[2]

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

Fig. 1: The Rose Bowl

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.

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			
CO_2	CO	TVOC	Form.
PM_{10}	$PM_{2.5}$	O_3	°C
RH	Air sp	dB	lux

Table 1: International benchmarks for IEQ

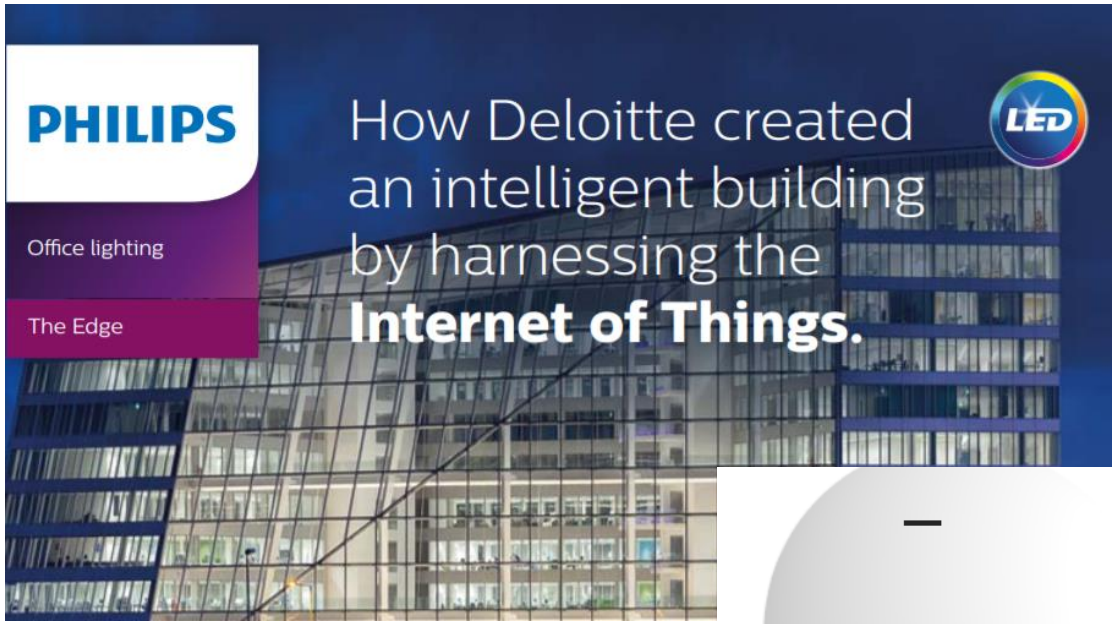
	Parameter	Guideline Limit or range (refs)
Health criteria	Carbon monoxide (CO)	**9ppm** (NABERS/LEED/WELL/WHO)
	TVOC	**500µg/m³** (NABERS/LEED/WELL)
	Formaldehyde	**100µg/m³** (NABERS/WHO)
	Particulates, PM_{10}	**50µg/m³** PM_{10} (NABERS/LEED/WELL)
	Particulates, $PM_{2.5}$	**15µg/m³** $PM_{2.5}$ (LEED/WELL)
	Ozone (O_3)	**80ppb** (LEED/NEPM)
	Carbon dioxide (CO_2)	**1000ppm** (ASHRAE)
Comfort criteria	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)

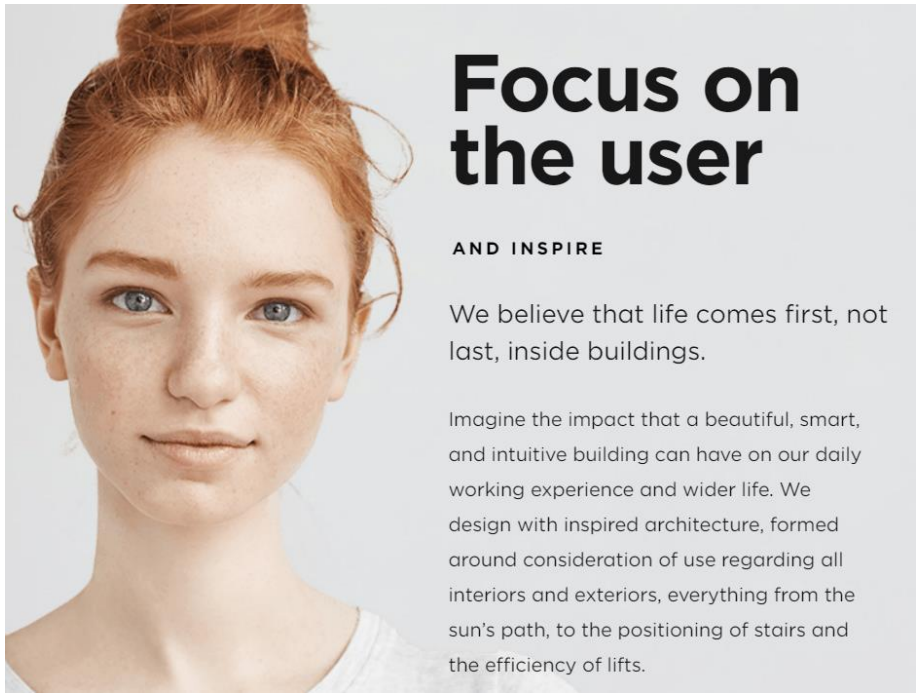
2. METHODOLOGY:

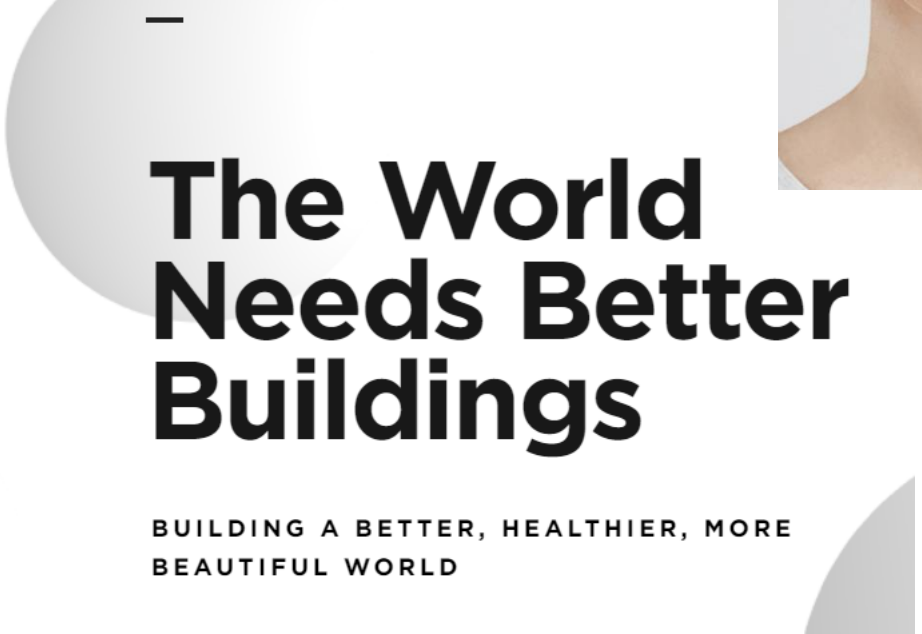
Classrooms, offices and a lecture theatre were all analysed to give a representation of the different uses of space within the building.

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

Case Studies: Philips Lighting and OVG Real Estate



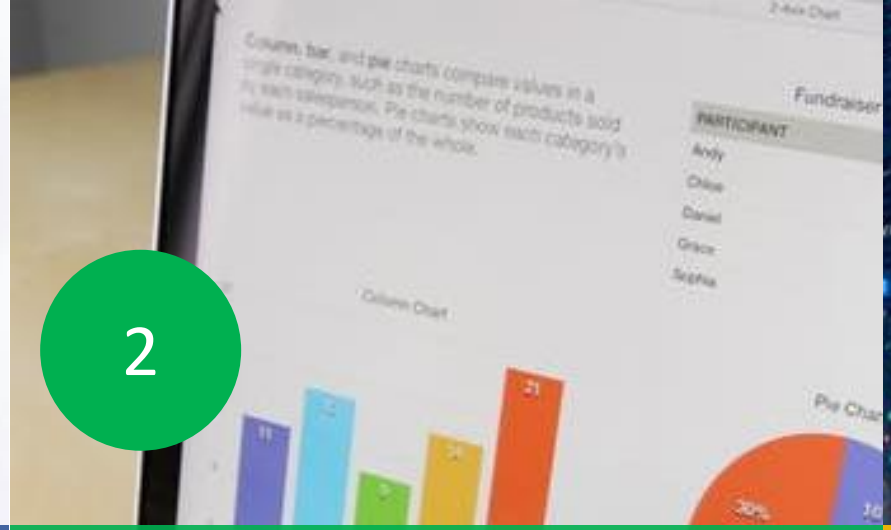





We need to build a
community dedicated to
Building 4 People

1

Health Data

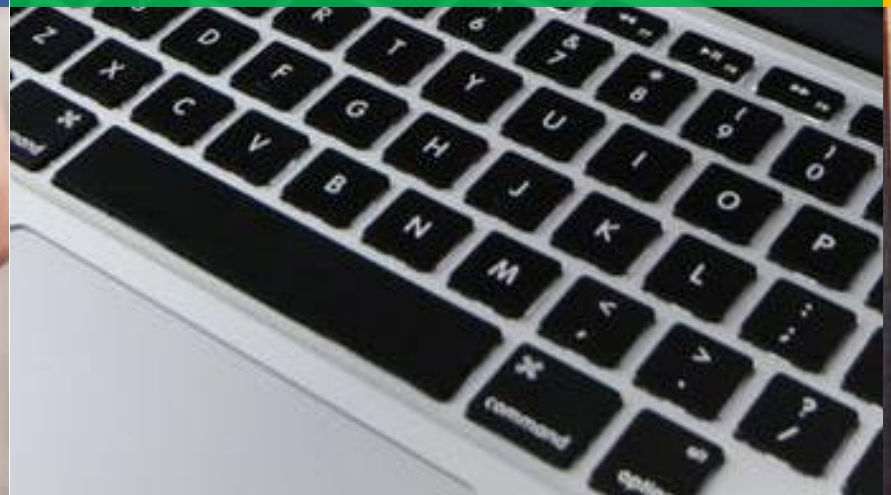


2

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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