



# Building 4 People: Building the business case for better office, school and hospital buildings in Europe

One third of European employees work in an office for an average of 8 hours a day, while most companies spend 90% of their operating costs on people, including salaries and benefits. Investing in building renovation can cut energy costs and improve the environment, though companies could reap the largest benefits by providing a comfortable, healthy and well-designed work space to improve employee performance, decrease staff turnover and absenteeism and thus boost business competitiveness.

Our analysis reveals that a holistic people-centric renovation of a typical office can lead to up to a **12% increase in employee productivity**. At a European scale, that could be **worth up to €500 billion annually**.

*“Offices account for 23% of the total floor area of the EU’s non-residential building stock.”*



12% INCREASE  
IN EMPLOYEE  
PRODUCTIVITY



€500  
billion  
WORTH UP TO  
€500 BILLION  
ANNUALLY.

## PEOPLE-CENTRIC OFFICES = HEALTHIER AND MORE PRODUCTIVE EMPLOYEES



**7-12%**

Maintaining ideal thermal comfort levels can increase productivity by 7-12%, worth up to €6,500 p.a. on average per employee.



**3-6%**

Plenty of fresh, clean air makes for a healthier working environment, boosting productivity by 3-6%, worth on average up to €3,200 p.a. per employee.



**3-6%**

Getting lighting right – including through good access to daylight and appropriate levels and quality of electric light – means 3-6% more output per employee, typically worth up to €3,200 p.a.



**3-4%**



**2-3%**

Better acoustics, particularly in open-plan offices, reduce distraction and make for a more conducive working environment. The resulting improvement in productivity is 2-3%, worth up to €1,600 p.a. on average for each person.

On behalf of Buildings 2030, BPIE undertook extensive research into both published and unpublished studies which quantified one or more benefits from building renovations that improved the indoor environment in offices, schools or hospitals. For details of the methodology, including all reference sources, please refer to the accompanying report [\[Building 4 People\]](#).

## WHAT ARE THE MAIN FACTORS INFLUENCING INDOOR ENVIRONMENTAL QUALITY?

The Buildings 2030 White Paper “People-Centric Buildings for European Citizens”<sup>1</sup> identifies four key parameters influencing indoor environmental quality:

- Getting the optimal **thermal comfort** level, which may vary with the local climate and weather conditions, will help people to stay focused and perform better.
- Good **indoor air quality** comprises an adequate fresh air supply, low levels of pollutants such as CO<sub>2</sub>, particulate matter and volatile organic compounds, and an absence of odours. This reduces the risk of “sick building syndrome” symptoms such as coughing and headaches.
- Optimal **lighting** which maximises daylight and tailors electric lighting to the tasks being performed improves people’s mood, alertness and ability to carry out daily tasks.
- **Noise** attenuation through renovation and appropriate use of insulation can almost fully shut out external noise and improves internal acoustics, enabling occupants to focus better and avoid stress.



## BOOSTING EDUCATIONAL PERFORMANCE IN SCHOOLS, COLLEGES AND UNIVERSITIES



**3-8%**

POTENTIAL  
IMPROVEMENT  
IN LEARNING  
PERFORMANCE

Educational buildings account for 17% of Europe’s non-residential building stock. Research shows that poor indoor environmental quality can significantly affect students’ health, attendance, concentration and learning performance. Children are more vulnerable to their environment than adults, so it’s vital that schools are designed and refurbished with the aim of maximising all dimensions of indoor environmental quality. Parents – and their employers – benefit too if children spend less time off school sick.

Our research shows that improving indoor environmental quality has a clear impact on learning ability, meaning that children and students can achieve the same educational attainment in around 10 fewer days annually. So, a school year could be two weeks shorter, with the “saved” days being used for additional teaching, extra-curricular activities or longer holidays. Our headline findings show that, across the factors influencing indoor environmental quality, performance could be improved by between 3% and 8%.



**4-8%**

Temperature



**4-7%**

Air quality



**3-7%**

Light



**3-8%**

Daylight



**3-6%**

Noise

<sup>1</sup> <https://www.buildings2030.com/wp-content/uploads/2017/11/Buildings2030-Building4People-White-paper.pdf>

Healthcare buildings account for 7% of the total floor area of the EU's non-residential building stock



GETTING THE INDOOR ENVIRONMENT RIGHT IN HOSPITALS

## HOSPITALS THAT FACILITATE BETTER HEALING

Getting the indoor environment right in hospitals is essential if we are to provide the best conditions for patients to get better. The right temperature, lighting and acoustic conditions for the different wards and rooms will enable staff to carry out their life saving work more effectively. Reducing the risk of cross-infection is an important aspect, for which a good quality ventilation system is essential. Patients will recuperate more quickly with access to daylight and an attractive view, while reducing noise levels has positive effects on heart-rate, pulse, respiration and sleep.

Among the quantified benefits of improved indoor environmental quality in hospitals, we found:

- Patients' length of stay can be reduced by 11%
- Medication costs are reduced by up to 21%
- Mortality in one children's hospital was reduced by up to 19%
- Employee turnover is reduced by up to 20%

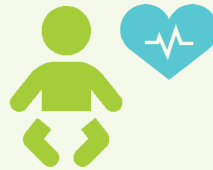
### HEALTHCARE BUILDINGS ACCOUNT FOR 7% OF THE TOTAL FLOOR AREA OF THE EU'S NON-RESIDENTIAL BUILDING STOCK



PATIENTS' LENGTH OF STAY CAN BE REDUCED BY 11%



MEDICATION COSTS ARE REDUCED BY UP TO 21%



MORTALITY IN ONE CHILDREN'S HOSPITAL WAS REDUCED BY UP TO 19%



EMPLOYEE TURNOVER IS REDUCED BY UP TO 20%



## ACT NOW TO IMPROVE THE QUALITY OF LIFE OF OFFICE WORKERS, CHILDREN AND PATIENTS

By renovating our workplaces, schools and hospitals to improve the indoor environmental quality, we can increase productivity, boost academic performance and improve the healing process. **Building owners, real estate managers, tenants, occupiers and professionals across the built environment supply chain have a key role to play in demanding and delivering these benefits by:**

- 1** — **Choosing and investing in better buildings as a strategic objective:** We encourage real estate investors, planners, public authorities and every employer to make indoor environmental quality a priority consideration.
- 2** — Including the value of the **health, well-being and performance benefits alongside energy cost savings within cost-benefit analyses** when appraising building renovation options and new construction.
- 3** — Ensuring an ongoing dialogue between **HR and facilities management** functions to ensure that buildings are always operating to maximise the indoor environmental quality.
- 4** — **Gathering data and feedback from building users and smart sensors** so that settings can be adjusted to meet the specific needs of occupants. Building owners and managers can play a key role in addressing the knowledge gaps (see box) by monitoring and publishing results on the performance of renovated buildings with high indoor environmental quality standards. Digitalisation can facilitate **knowledge-sharing across the supply chain** to help deliver energy-efficient, people-centric buildings.
- 5** — **Engaging the education, health and health insurance sectors** as allies and key stakeholders in supporting the case for better and faster renovation of our buildings.
- 6** — **Leading by example:** Real estate developers, investors and planners can lead the way in raising indoor environmental quality standards across their portfolios, which will eventually influence other players. The public estate in particular has a key role to play, since it accounts for around 12% of all non-residential buildings.

### GAPS IN THE KNOWLEDGE BASE

Significant gaps remain in our knowledge of the full impact of indoor environmental quality on the health, well-being and performance of building occupants. There is a lack of holistic, longitudinal studies set in real environments and using a consistent set of metrics to measure all indoor environment parameters and their impact on people. Furthermore, technologies and building types are not evenly represented in the research. Most studies to date focus on temperature, indoor air quality and light, while the impact on patients and personnel in hospitals remains under-represented.

More on the study can be found at [www.bpie.eu](http://www.bpie.eu) and [www.buildings2030.com](http://www.buildings2030.com)

This project is sponsored by:

