

NatureConnect

by Signify

**NatureConnect**  
Lighting inspired by nature

Evidence

# Evidence

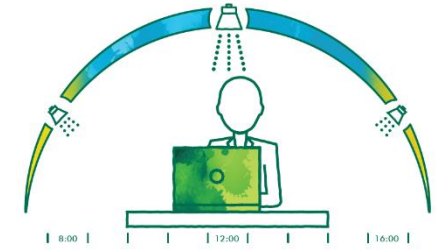
## Supporting our natural rhythm

Changing white light intensity and color during the working day makes you happier and more focused. Our brains regulate the circadian rhythm, or inner biological clock, based on light cues from our environment.

The Healthy Offices Research conducted by CBRE and the University of Twente confirms the relationship between people's working environment, their health, wellbeing and ability to perform at their best.

Outcomes after mimicking the sunlight rhythm:

- 12% measured / 18% perceived improved performance
- 71% feel more energised
- 76% feel happier
- 50% feel healthier
- 57% feel more alert
- 60% feel more motivated



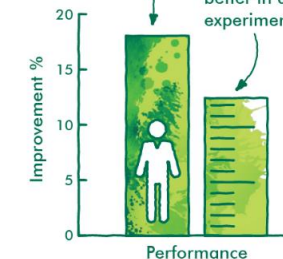
### OUTCOMES SURVEY



### OUR RESEARCH PROVES

Participants perceived a **18%** improvement of their performance

Participants performed **12%** better in an objective experiment



Source:  
The Snowball Effect of Healthy Offices,  
CBRE, 2017

### CBRE HEALTHY OFFICES RESEARCH

UNIVERSITY OF TWENTE IN COLLABORATION WITH CBRE

MULTIDISCIPLINARY STUDY

124 PARTICIPANTS

7 MONTHS

5 RESEARCH METHODS

> 100,000 DATAPOINTS

# Evidence

## Providing a view to the sky (1/2)

Access to natural light and views of the outdoors are the **nr 1** attribute of the workplace environment.

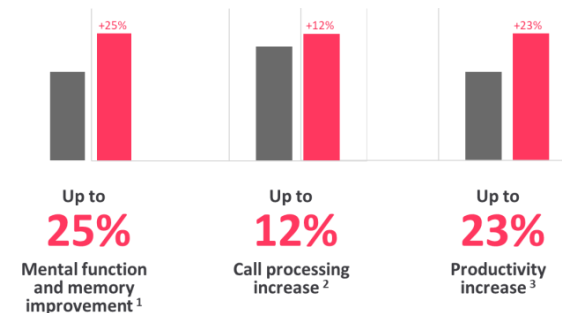
**47%** of employees admit they feel tired or very tired from the absence of natural light or a window at their office.

1614 office employees interviewed, "The Employee Experience", Future workplace, 2016

Research with 200 office workers shows improvements for those who had the best possible view versus those with no view:

- **Up to 25%** mental function and memory improvement
- **Up to 12%** call processing increase
- **Up to 23%** productivity increase

Heschong et al., Windows and offices: a study of office worker performance and the indoor environment, California Energy Commission, 2003



Source:  
Heschong  
et al.



# Evidence

## Providing a view to the sky (2/2)

The access to natural views and bright light exposure via artificial skylight is associated with psychological comfort, increased productivity and assumed health.

**57%** of the participants indicated a natural daylight experience in presence of artificial skylight.

Meerbeek et al., Proceedings of Experiencing Light, 2014

Research with 100 participants indicates that an artificial skylight was perceived as very natural and attractive in creating the impression of a daylight opening in the ceiling.

Canazei et al., Lighting Research and Technology 48, 2015

An artificial skylight has a calming effect over time and leads to a decreased heart rate.

Canazei et al., Gerontology 63, 2017





# Evidence

## Being immersed in nature

Biophilic design reduces stress, improves cognitive function and creativity and is essential for providing opportunities to live and work in spaces with greater overall health and wellbeing.

Browning et al., 14 Patterns of Biophilic Design, Terrapin Bright Green, LLC, New York, 2014

Being immersed in (artificial) nature leads to the following benefits:

- Positively impacted cognitive performance  
Mehta, Zhu & Cheema, 2012; Ljungberg, Neely, & Lundström, 2004
- Emotional restoration, with lower instances of tension, anxiety, anger and fatigue  
Alcock et al., 2013; Barton & Pretty, 2010; Hartig et al., 2003; Hartig et al., 1991
- Positively impacted attitude and overall happiness  
Barton & Pretty, 2010





# Biological impact of light

## Circadian rhythm

Changing white light intensity and color during the working day makes you productive and focused. Our brains regulate the circadian rhythm, or inner biological clock, based on light cues from our environment.

CBRE research on Healthy Offices confirms the relationship between people's working environment, their health, wellbeing and ability to perform at their best:

- 12% measured / 18% perceived improved performance
- 71% feel more energised
- 50% feel healthier
- 57% feel more alert

Source: The Snowball Effect of Healthy Offices, CBRE, 2017

Biological  
function better



# Emotional impact of light

## Nature and natural analogues

Access to natural light and views of the outdoors are the **nr 1** attribute of the workplace environment.

**47%** of employees admit they feel tired or very tired from the absence of natural light or a window at their office.

Source: 1614 office employees interviewed, "The Employee Experience", Future workplace, 2016

The access to natural views and bright light exposure via artificial skylight is associated with psychological comfort, increased productivity and assumed health. 57% of the participants indicated a natural daylight experience in presence of artificial skylight.

Source: Meerbeek et al., Proceedings of Experiencing Light, 2014

Link with nature relates to emotional restoration, with lower instances of tension, anxiety, anger and fatigue and positively impact attitude and overall happiness.

Source: Alcock et al., 2013; Barton & Pretty, 2010; Hartig et al., 2003; Hartig et al., 1991

Barton & Pretty, 2010

Emotional  
feel better





# Increase value of spaces with limited or no natural daylight

NatureConnect creates inspiring environments to transform sub-optimal or redundant spaces in premium spaces:

- Increase value of space
- Increase occupancy rate

## Business impact calculation

- Adding a view will increase the rental price value with 10–50%, depending on amount of available daylight.
- For a space with no daylight in **Amsterdam**:
  - Current space at 50% value: 238 €/m<sup>2</sup>
  - 10% increase: + 24 €/m<sup>2</sup>
  - 50% increase: + 119 €/m<sup>2</sup>
- For a space with no daylight in **London**:
  - Current space at 50% value: 436 €/m<sup>2</sup>
  - 10% increase: + 44 €/m<sup>2</sup>
  - 50% increase: + 218 €/m<sup>2</sup>



## Facts & Data

- Spaces without daylight have <50% value
- Almost 50% US offices do not have natural daylight  
(HumanSpaces: Global Impact of Biophilic Design in the Workplace, 2015)
- In highly populated areas often building expansion happens underground with no access to daylight
- Depending on location average rental prices vary  
(e.g. Amsterdam: 475 €/m<sup>2</sup>; London 872 €/m<sup>2</sup>)  
(Statista.com)



# Increase value of spaces with limited or no natural daylight

## Facts & Data

Study targeting full-time employees working across different sectors and in organizations of different sizes reports:

- The access to natural light and views of the outdoors are the nr 1 attribute of the workplace environment.
- 1/3 of the employees indicate that they don't get enough natural light in their workspace.

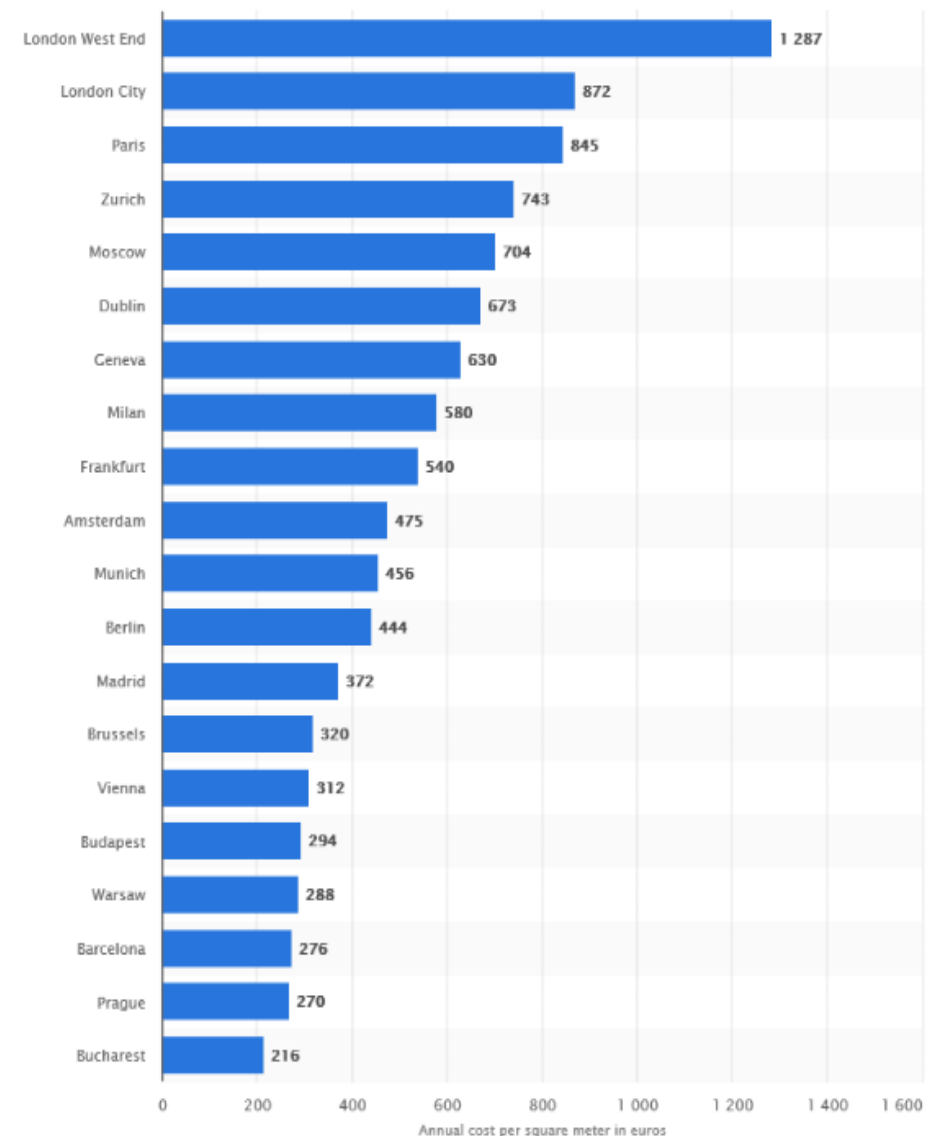
1614 office employees interviewed, "The Employee Experience", Future workplace, 2016

Bright light influences human psychophysiology instantaneously by inducing endocrine (suppression of melatonin, increasing cortisol levels), other physiological changes (enhancement of core body temperature), and psychological changes (reduction of sleepiness, increase of alertness).

M Rüger et al., Time-of-day-dependent effects of bright light exposure on human psychophysiology, Am J Physiol Regul Integr Comp Physiol. 2006

## Rental price €/m<sup>2</sup> – EU 2019

Source: statista.com



# Prevent loss of value due to employee absence and turnover

NatureConnect enhances wellbeing and creates a pleasant work environment in which people feel happy and healthy, assumed to impact:

- Sick leave and absenteeism
- Voluntary leave and retain talent

## Business impact calculation

- For a company with 100 employees:
  - **Reduction of sick leave** from avg 3.5% to 2.5% translates to a prevention of loss of value (in terms of salary) of 350 € pp and **35.000 €** for the whole company per year.
  - **Reduction of voluntary leave** from avg 10% to 8% means 8 instead of 10 employees leaving the company voluntarily, which translates to a saving of **9.000 €** recruitment costs per year.



## Facts & Data

- Sick leave time on average 3-4% /yr (WHO, 2019)
- Average salary West Europe 30.000-40.000 €/yr (ec.europa.eu/eurostat)
- Voluntary leave: average 10% (HBR, 2016)
- Time to hire: 40-62 days & recruitment costs: € 4.500 pp (resources.workable.com)
- Sickness reduction when incorporating daylight:
  - 2% (IWBI)
  - 1.25% (Hanzehogeschool Groningen)
  - 0.50% (TU Delft)



# Prevent loss of value due to employee absence and turnover

## Facts & Data

Swedish construction and development company Skanska, was able to cut sick days by two-thirds after it rebuilt its offices in Doncaster, amongst others by installing a central light well that increased the natural daylight in the building. The company saved £28,000 in staff costs in 2015.

World Green Building Council report: Building the Business Case: Health, Wellbeing and Productivity in Green Offices, 2016

Occupants of high-performing, certified green buildings had ~30% fewer sick building symptoms, 6.4% higher sleep quality and 26.4% higher cognitive function score.

Harvard T.H. Chan School of Public Health and SUNY Upstate Medical University, The Impact of Working in a Green Certified Building on Cognitive Function and Health , 2016

Daylight availability and quality have a large impact on sick leave which increases to 6.5% when employees are lacking daylight access and a view to the outdoors.

Elzeyadi, Daylighting-Bias and Biophilia: Quantifying the Impact of Daylighting on Occupants Health, Leed, 2011



# Boost performance due to more engaged and satisfied workforce

NatureConnect allows employees to get the best out of themselves and boosts employee performance

- Improve engagement and workplace satisfaction
- Make people feel more energetic
- Stimulate interaction and collaboration

## Business impact calculation

- For a company with 100 employees:
  - **1% performance increase** translates to a value (in terms of salary) of 350 € pp and **35.000 €** for the whole company per year.
  - **3% performance increase** translates to a value (in terms of salary) of 1.050 € pp and **105.000 €** for the whole company per year.



## Facts & Data

- Average salary West Europe 30.000–40.000 €/yr  
([ec.europa.eu/eurostat](http://ec.europa.eu/eurostat))
- Increased productivity in different studies when incorporating daylight experience in offices:
  - 12% measured and 18% self-indicated (CBRE, 2017)
  - 6–9% (IWBI, 2016)
  - 16% (HBLS 16, 2016)



# Boost performance due to more engaged and satisfied workforce

## Facts & Data

Companies with a high level of engagement reported 21% higher productivity.

Sorenson, How employee engagement drives growth, Gallup meta-analysis of 1.4 million employees, 2013

12% (measured) and 18% (self-indicated) increased productivity using circadian light compared to normal lighting.

CBRE, Healthy offices 2017

16% increased productivity of students

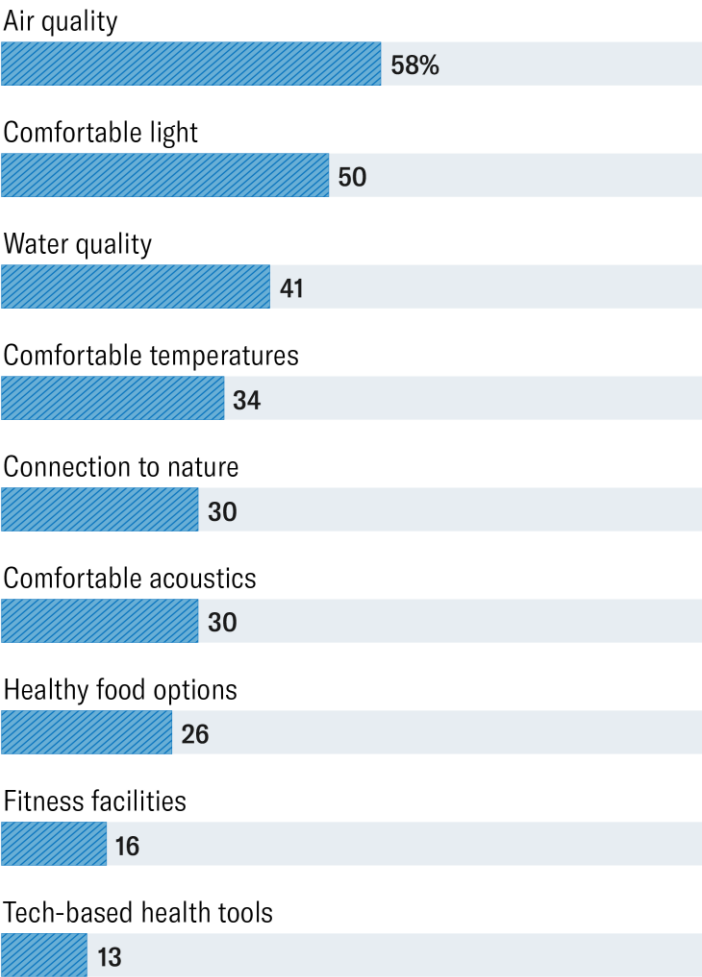
N. Shishegar, M. Boubekri: Natural Light and Productivity, Analyzing the Impacts of Daylighting on Students' and Workers' Health and Alertness, "Health, Biological and Life Science" (HBLS-16) April 18-19, 2016

Daytime light supports daytime functioning such as cognitive performance, alertness in healthy subjects

Viola et al, Scand J Work Environ Health 2008; Smolders et al, Physiol Behav. 2012; Geerdink M. In search of light therapy to optimize the internal clock, performance and sleep, PhD RuG 2017

## Workplace Wellness Perks That Matter to Employees

A survey of 1,600 workers reveals that air and light matter much more than tech-based health tools.



Survey:  
What employees want most from their workspaces, HBR 2019

Graph:  
Future Workplaces

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