Our Vision

Our Focus

Our Partners

signify

Agenda:

- Signify & Schaedler yesco !
- Global & Industry Trends
  - Market drivers & Disruptions
  - Science and Technology
- Innovation Highlights
- Open Q&A

Signify

the meaning of light

Our **purpose** is to unlock the **extraordinary potential** of light for **brighter lives** and a **better world**.

Our **goal** is to become the undisputed leader in **sustainable**, **connected** lighting solutions, as recognized by our customers.

Schaedler yesco

Schaedler Yesco Distribution, established in 1924, is a provider of complete **connected** solutions for the electrical industry.

With 23 locations throughout Pennsylvania and New York, the company offers services and solutions for **lighting, datacomm, automation**, and **industrial** needs.

As a family- and employee-owned company, we understand that business is about more than having the right products. It's about **integrity, reliability, and expertise**. With nearly a century of industry knowledge, an impressive roster of professional certifications, and lots of in-the-field job experience, our team has the practical know-how to help our customers overcome challenges, make educated choices, and experience successful outcomes.

signify

Global & Industry Trends

signify

Source: The National Human Activity Pattern Survey (NHAPS)

Companies increasingly realize that investing in the Health & Wellbeing of their employees is the best investment in their business

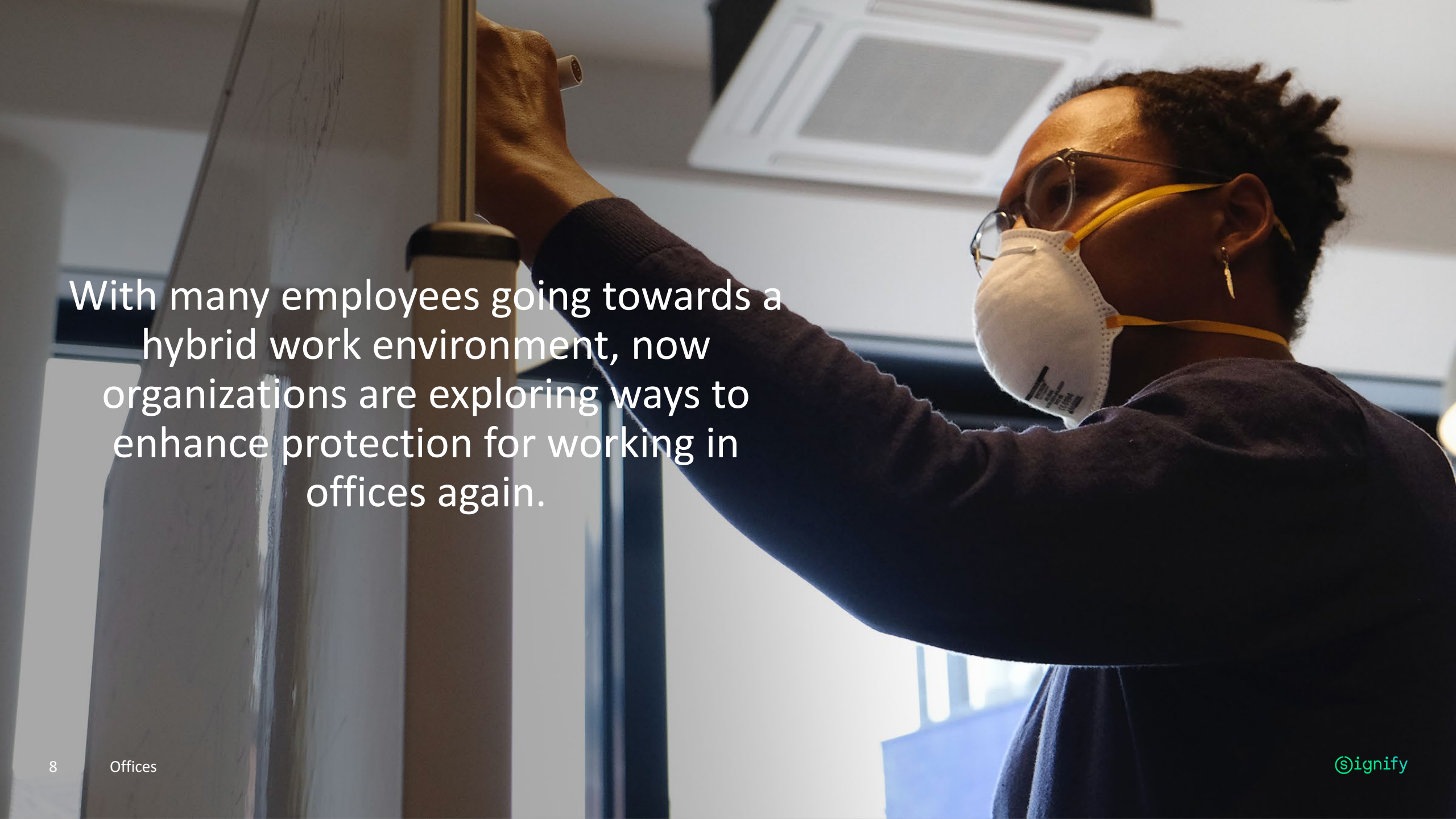
1%
for energy

9%
for rent

90%
for employees

Source: Nature Inside A biophilic design guide, W.D. Browning, C.O. Ryan, 2020

signify



With many employees going towards a hybrid work environment, now organizations are exploring ways to enhance protection for working in offices again.

Wall Street Journal Video

Video Link:

https://www.wsj.com/video/how-risky-is-the-classroom-with-covid-19-controls-in-place/A95D4102-25F0-4B26-B5BE-C85B84F9FB2C.html

3/18/2021 1:10PM

How Risky Is the Classroom With Covid-19 Controls in Place?

A year into the coronavirus pandemic, many schools are only partially open for fear they could fuel the spread of the virus. Experts explain what the actual risks are for spreading Covid-19 in schools and how proper controls can change that equation. Illustration: Preston Jessee for The Wall Street Journal

signify

American Rescue Plan ESSER Fund Allocation [1]

The American Rescue Plan Elementary and Secondary School Emergency Relief (ARP ESSER) Funds are eligible for measures in line[1,2] with the CDC's K-12 operational strategy guidance to improve air quality, reduce the risk of virus transmission, and keep educators, staff, and students safe for in-person learning.

Text Excerpt:

<<<<<<<

- repairing and improving school facilities to ***reduce risk of virus transmission*** and exposure to environmental health hazards;
- ***improving indoor air quality***;

>>>>>>>

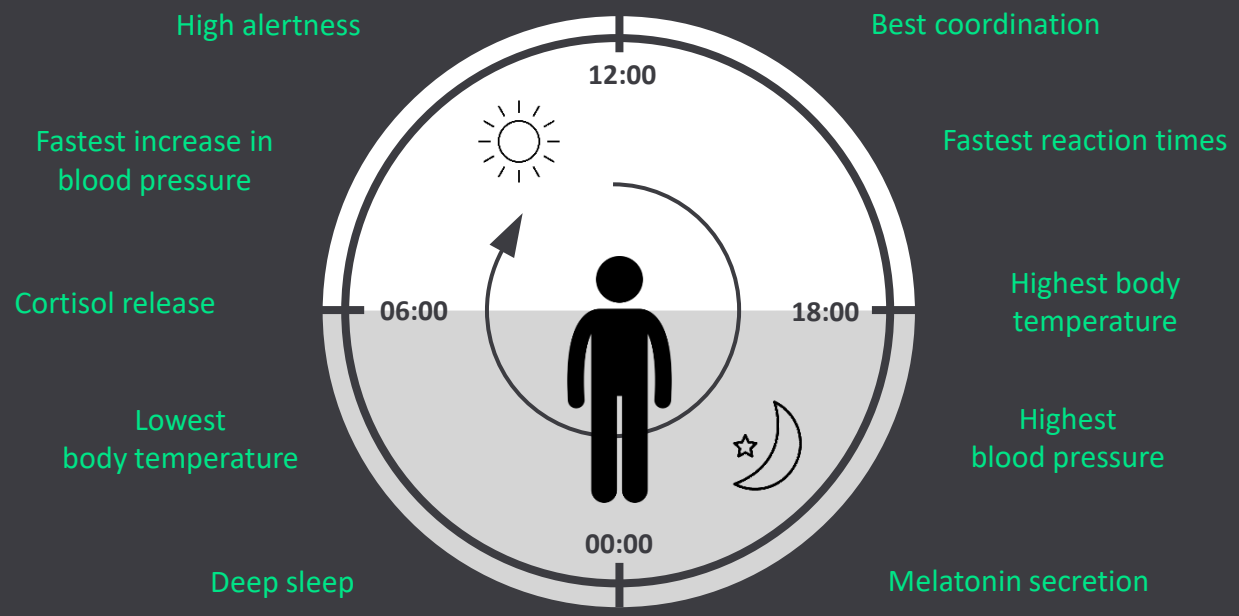
Newly available funding, sorted by $s[3]:

CALIFORNIA	15,068,884,546
TEXAS	12,418,588,778
NEW YORK	8,988,780,836
FLORIDA	7,038,246,438
ILLINOIS	5,054,988,054
PENNSYLVANIA	4,996,953,151
OHIO	4,472,067,097
GEORGIA	4,249,371,244
MICHIGAN	3,719,833,128
NORTH CAROLINA	3,599,191,706
PUERTO RICO	2,965,938,760
NEW JERSEY	2,764,587,703
LOUISIANA	2,605,463,325
ARIZONA	2,582,098,697
TENNESSEE	2,487,638,081
SOUTH CAROLINA	2,112,051,487

1) https://www.ed.gov/news/press-releases/department-education-announces-american-rescue-plan-funds-all-50-states-puerto-rico-and-district-columbia-help-schools-reopen
2) https://oese.ed.gov/files/2021/03/FINAL_ARP-ESSER-FACT-SHEET.pdf
3) https://oese.ed.gov/files/2021/03/ARP-ESSER-twothird-onethird-Allocations_Final-1.pdf

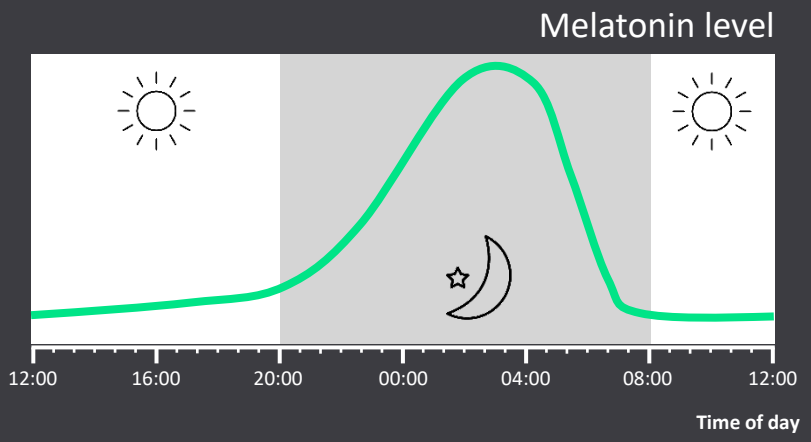
signify

Many aspects of human physiology and behavior are dominated by 24-hour rhythms



Parameters that determine the biological effect :

- Light intensity
- Light spectrum
- Light distribution
- Time of day
- Duration

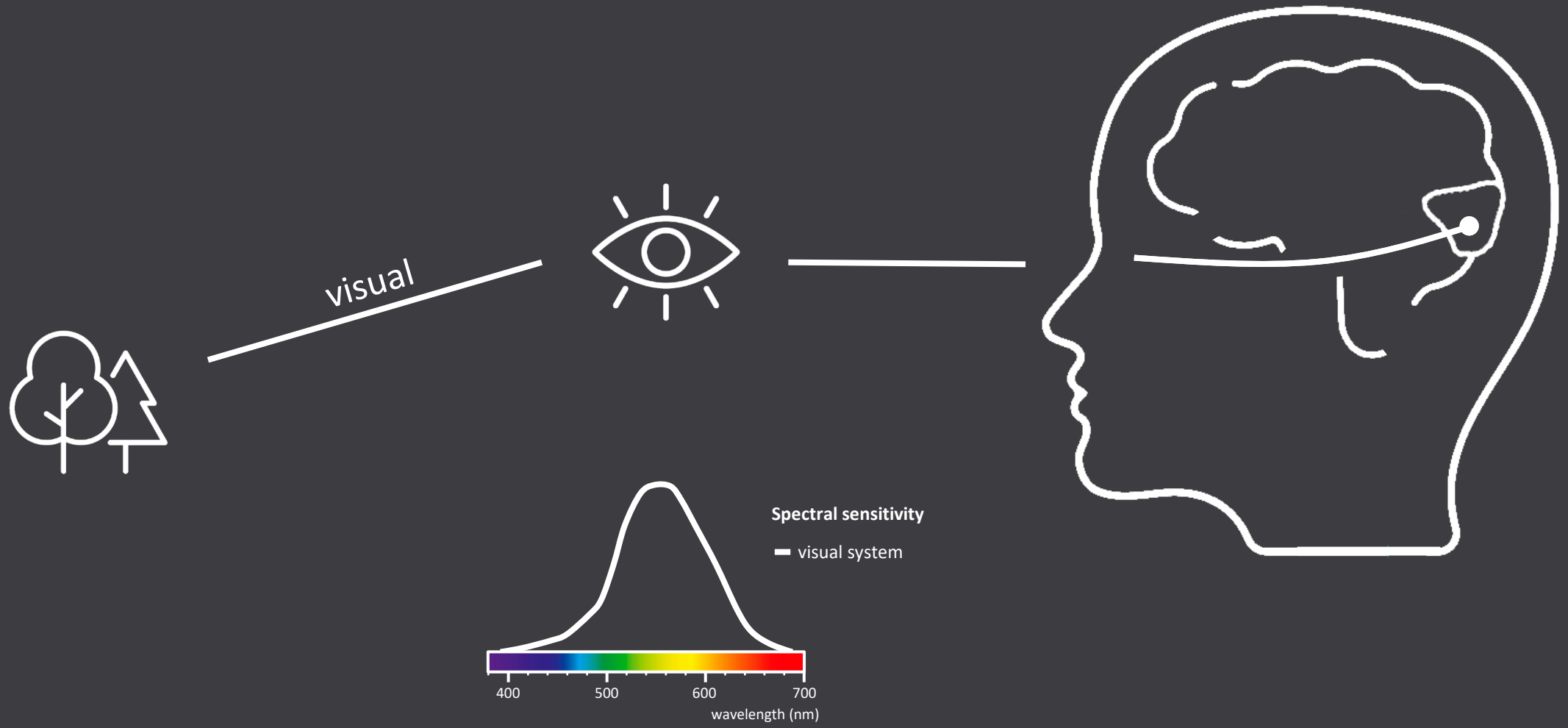


Biological

function better

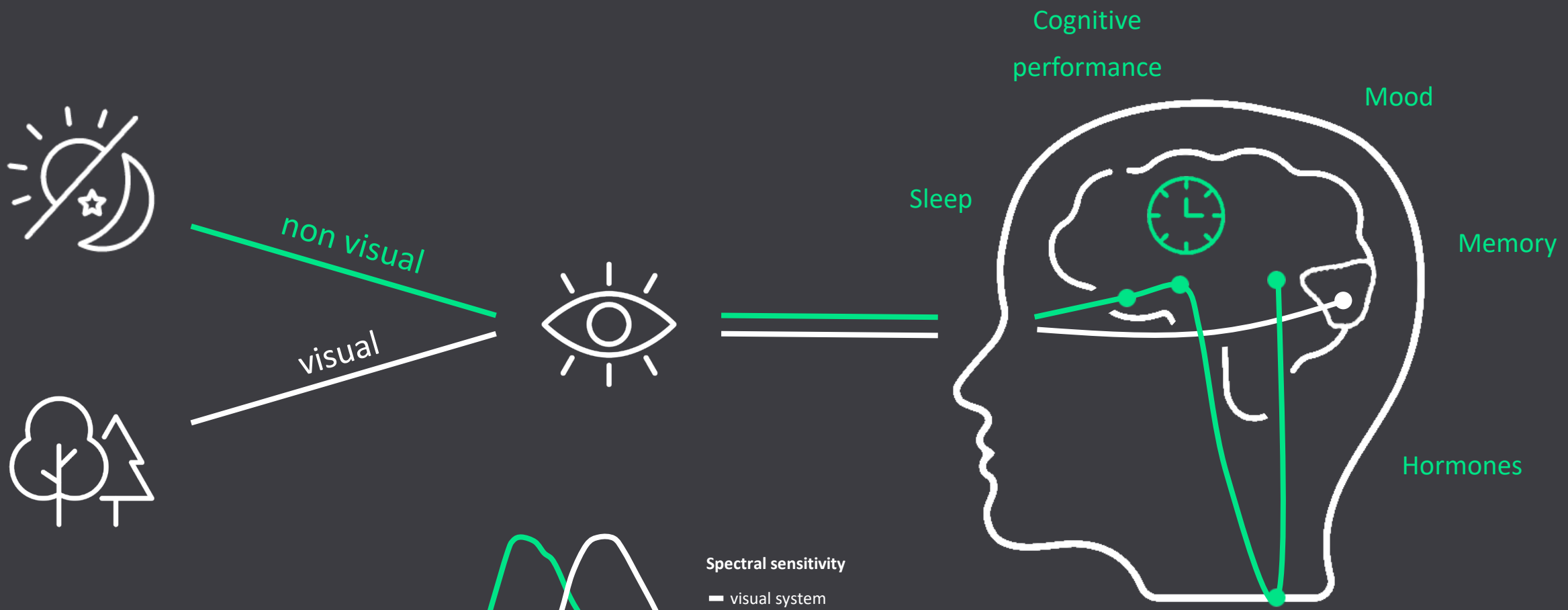
signify

Light enables us to see better…



signify

Light enables us to see better, function better and feel better



visual
biological
emotional

Source: Mignot et al. Nature 2002, Taillard et al. Elsevier 25-43, 2012

signify

Evidence
Providing a view to the sky

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

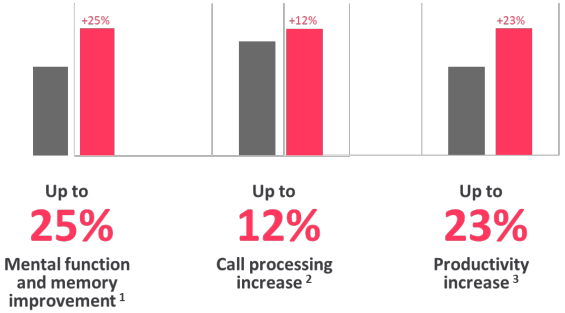
47% of employees admit they feel tired or very tired from the absence of natural light or a window at their office.

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.

signify

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

Harvard Business Review confirms that comfortable light and outdoor views are key for improved Health & Wellbeing

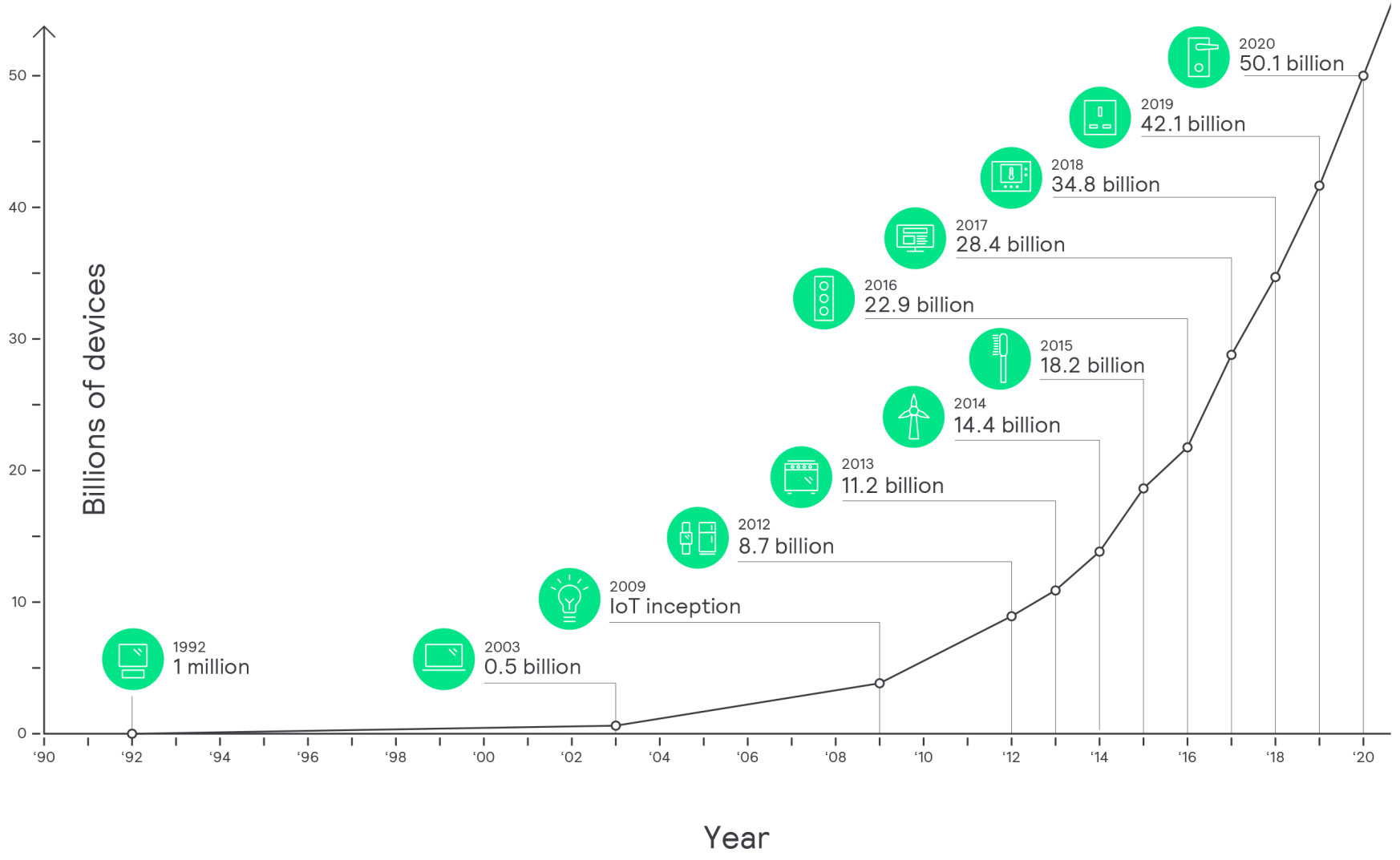
A survey of 1,600 workers reveals that ‘Comfortable light’ and ‘Connection to nature’ are in the top-5 of Workplace Wellness Perks. They matter much more than tech-based health tools according to Harvard Business Review.

Source: Workspace survey: What employees want most for their workspaces, JC. Meister, HBR 2019

Harvard Business Review

signify

How do we connect in the future?

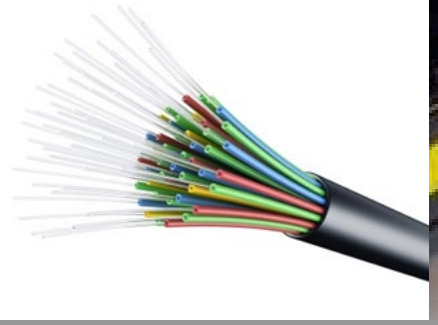


signify

Distribution

Today, data traffic is distributed either via wire or via radio communication

Wired



Wireless

ZigBee

Wi Fi

LoRa

Z-WAVE

3G

4G LTE

5G

©ignify

Brighter Lives, Better World 2025 program

We successfully completed Brighter Lives, Better World 2015 - 2020

Carbon neutral

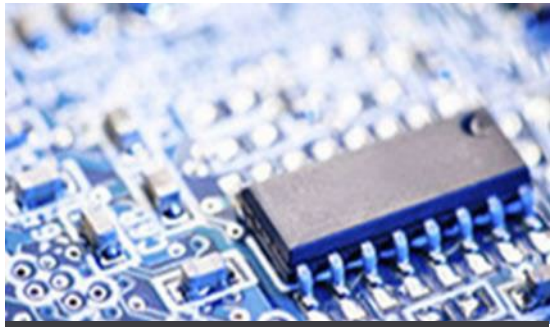
100% renewable electricity

2.9 billion LED delivered

6 million lives lit

Zero waste to landfill

84% Sustainable revenues



99% supplier performance

67% less safety incidents

CDP

A list for climate and supply chain

Member of Dow Jones Sustainability Indices Powered by the S&P Global CSA

World Index since our IPO and top 1% in our industry

SUSTAINALYTICS

a Morningstar company

#1 in electronics industry

PLATINUM Top 1% 2020 ecovadis Sustainability Rating

Platinum top 1%

Global Climate Action

United Nations Climate Change

External recognition for continuous leadership in sustainability in 2021

Member of Dow Jones Sustainability Indices Powered by the S&P Global CSA

World Index & #1 (Gold Class)

VBDO 25 jaar duurzaam

Leader

Global Climate Action United Nations Climate Change

Received at Cop 26

Ministry of Economic Affairs and Climate Policy

“Most innovative Annual report” 2021

SUSTAINALYTICS a Morningstar company

#1

vigeoeiris

#2

PLATINUM Top 1% 2021 ecovadis Sustainability Rating

Platinum & Top 1%

FTSE4Good

Index Series 21

EURONEXT INDICES BENELUX20 V.E VIGEO.EIRIS

Benelux 20

MSCI

AA

EQUILEAP MAKE A DIFFERENCE AND A RETURN

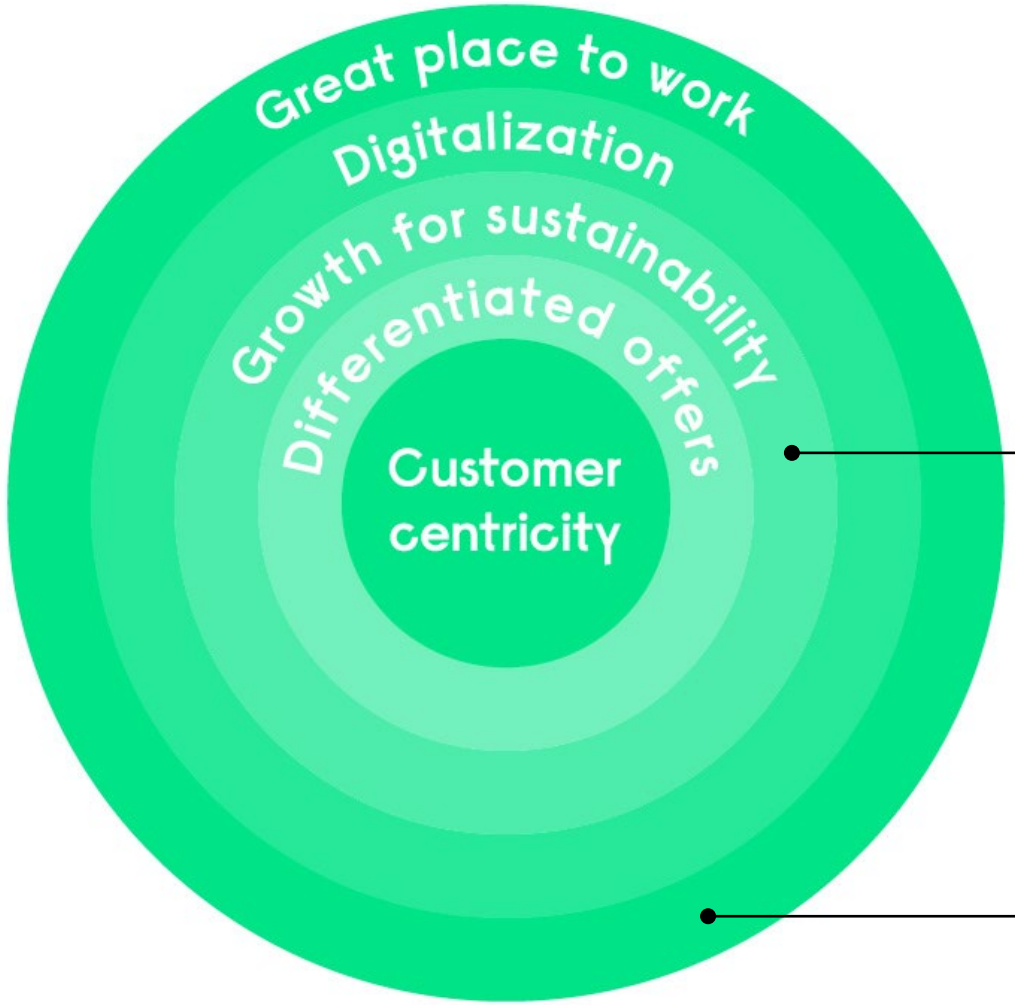
#2 for gender equality in our supply chain

CDP DISCLOSURE INSIGHT ACTION A LIST 2021

CDP DISCLOSURE INSIGHT ACTION SUPPLIER ENGAGEMENT LEADER

CLIMATE

Sustainability at the heart of our strategy



Sustainability focus and UN SDGs

Climate action	13 CLIMATE ACTION; 7 AFFORDABLE AND CLEAN ENERGY	Better World
Circular economy	12 RESPONSIBLE CONSUMPTION AND PRODUCTION	Better World
Food availability Safety & security Health & wellbeing	11 SUSTAINABLE CITIES AND COMMUNITIES; 3 GOOD HEALTH AND WELL-BEING	Brighter Lives
Great place to work	8 DECENT WORK AND ECONOMIC GROWTH	Brighter Lives

signify

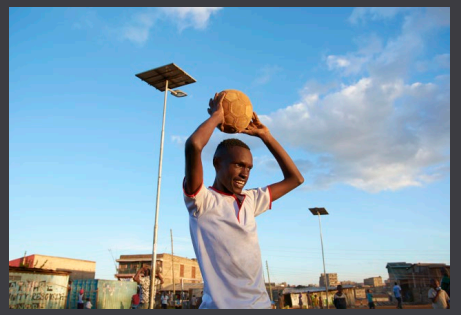
Our Brighter Lives, Better World 2025 program

We aim to double our positive impact on the environment and society

		Doubling objectives	Continue and strengthen	
Better World	Climate action	**Double** the pace we achieve the 1.5°C scenario of the Paris Agreement	Carbon neutral operations & 100% renewable electricity	13 CLIMATE ACTION
			Increase Climate action revenues from 58% to 72%	7 AFFORDABLE AND CLEAN ENERGY
	Circular economy	**Double** our Circular revenues to 32%	Zero waste to landfill and sustainable packaging	12 RESPONSIBLE CONSUMPTION AND PRODUCTION
Brighter Lives	Food availability	**Double** our Brighter Lives revenues to 32%	10 million lives lit through our Signify Foundation	3 GOOD HEALTH AND WELL-BEING
	Safety & security		Safe & healthy workplace with a TRC rate less than 0.30	11 SUSTAINABLE CITIES AND COMMUNITIES
	Health & wellbeing	**Double** our % of women in leadership to 34%	Supplier sustainability performance of 95%	8 DECENT WORK AND ECONOMIC GROWTH
	Great place to work			

Signify

Our **sustainable growth** areas emerge from addressing ***5*** global trends



Climate Action

Major Trends

- Energy accounts for **60% of greenhouse gas emissions**
- Customers want **companies to take a stand on sustainability**

Opportunity

- LED performance
- Systems offerings
- **Solar Lighting**

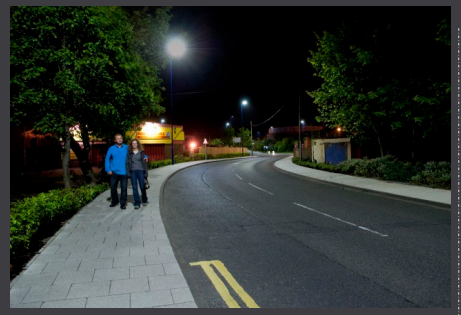
Circular Economy

Major Trends

- World economy **only 9% circular,** while resources are increasingly scarce
- Governments launching **circular economy programs** to reduce waste

Opportunity

- **3D Printing**
- Circular programs; Service Tag



Safety & Security

Major Trends

- Nearly **70% of population to live in cities** by 2050
- Smart streetlights used to **improve public safety** (e.g., gunshot detection, crowd analytics)

Opportunity

- Connected Infrastructure
- **BrightSites 5G Poles**
- Data Migration
- **LiFi**

Health & Wellbeing

Major Trends

- Global **wellbeing market grew** to $4.2t at ~13% for the last 2 years
- Better lighting contributes to **16% increase in productivity**

Opportunity

- Human Centric Lighting
- **NatureConnect**
- Patent Technologies: Accurender, MesoOptics

Food Availability

Major Trends

- **>25% of the world** experienced food insecurity in 2018
- **~70% food production increase** needed by 2035

Opportunity

- **Horticulture Lighting**
- **UV Lighting**

Source: Ericsson, Installers Survey, Bain IoT Customer Survey, Statista, Brand Preference Survey, OECD, Global Wellness Institute, Wellable Survey 2019, LEDified Report, Staples Office Worker Survey, Forbes, Korn & Ferry, CES, UN Reports, National Bureau of Economic Research, Industry Reports, S&MI analysis

Genlyte & Global Brands

We provide the solution to every lighting need

Lamps / Ballasts / Drivers / LEDs

PHILIPS

ADVANCE by signify

Controls & Connected Systems

interact

PHILIPS dynalite

COLOR KINETICS

Technology brands

BrightSites by signify

trulifi by signify

GENLYTE SOLUTIONS

Outdoor Luminaire Brands

LUMEC by signify

GARDCO by signify

HADCO by signify

Stonco by signify

Indoor Luminaire Brands

ALKCO

Day-Brite CFI by signify

CHLORIDE by signify

LEDALITE by signify

- NatureConnect by signify

LIGHTOLIER by signify

- LIGHTOLIER by signify
- 3D printed lighting

Effective 2022, Global technologies shall be marketed under spec grade brands

Global Trends

- We are indoors a lot
- Employee, student/parent, and the public expectations
- Connectivity is king

signify

LIGHTOLIER

by signify

3D printed lighting

signify

LIGHTOLIER

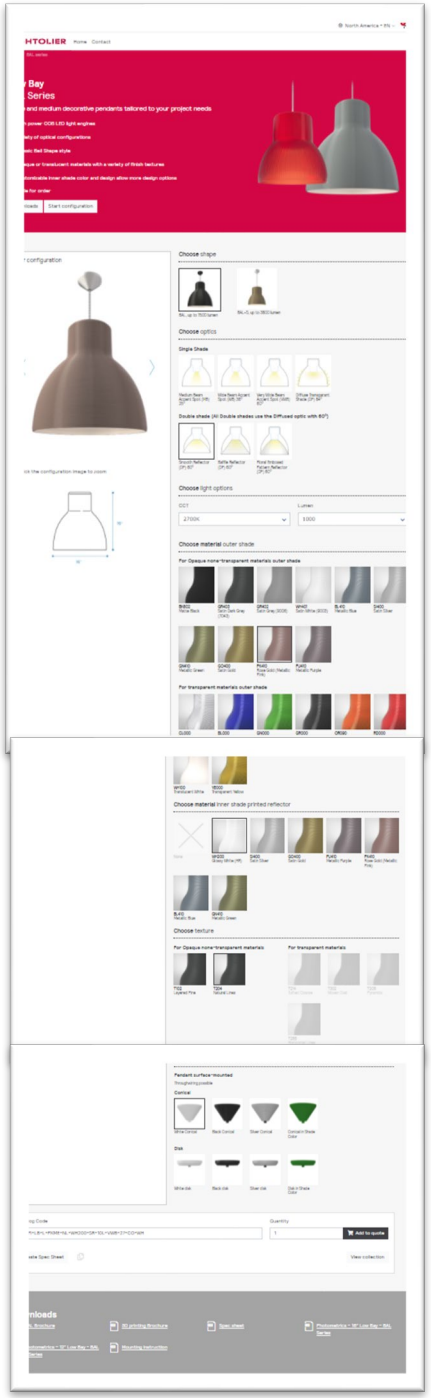
by signify

3D printed lighting

Key update: *3D Online Configurator*

- *From: www.tailored.lighting.philips.com/*
- *To: www.3dprinted.lighting.lightolier.com/*

SCAN ME



LIGHTOLIER
by signify

3D printed lighting

MS Series ›

Track Lighting

- Outstanding energetic performance to save energy costs & CO2 emissions
- Many options to suit your needs

PM Series ›

High Bays

- Big output, tiny input. Select our 25,000 lumen lamp or choose your own lumen levels from a variety of Philips LED HID replacement lamps
- Multiple light sources possible
- Light-weight yet durable polycarbonate construction that eases handling during installation

BAL series ›

Low Bays that Meet High Standards

- Opaque or translucent materials with a variety of finish textures
- Variety of optical configurations
- High power COB LED light engines
- Both Medium 12" and Large 16" sizes available

RD Series ›

Decorative Pendants

- Tailored to your preference
- Colorful, stylish, flexible
- Highlight your brand with a logo or other artwork deeply embossed into the surface of the fixture

Single Series ›

Large and medium modern decorative pendant fixtures tailored to your needs.

- Three contemporary shade designs
- Satin, transparent and metallic materials with eleven different textures
- Comfortable downlight effect

PD Series ›

Cylinder Pendants

- Ensure ease of long-term maintenance with the timeless industry standard E26 socket and your choice of PAR 38 or PAR 30 LED lamps
- Build for re-design, easily changed
- Maximize visual appeal, beam spreads options, color temperatures and lumen options by selecting from a variety of Philips PAR Lamps

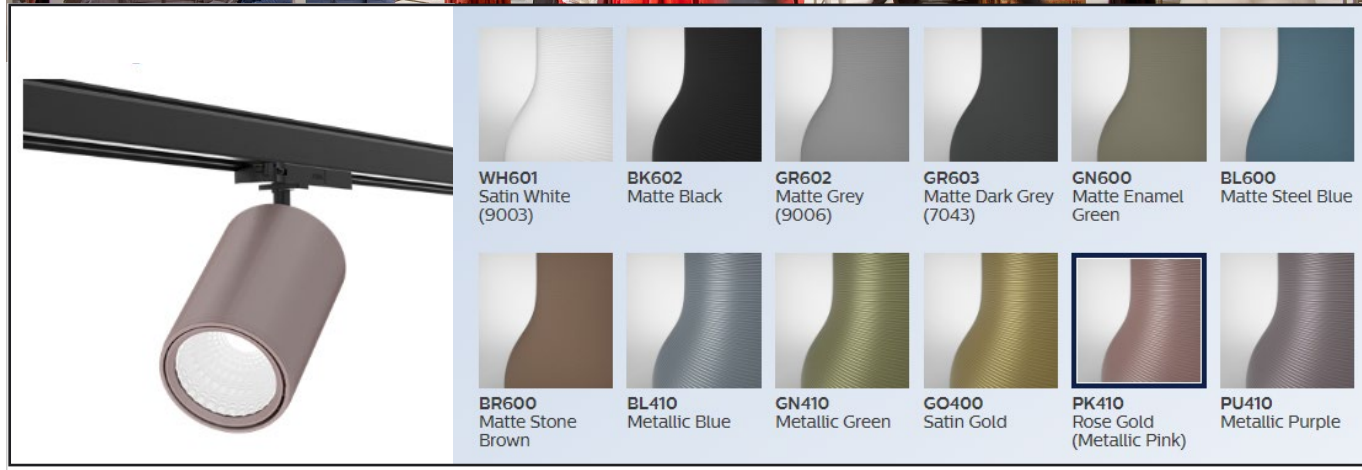
SCAN ME

signify

LIGHTOLIER
by signify
3D printed lighting

| Track

- **Lumen packages**
  - 600
  - 1100
  - 2300
- **CCT**
  - 2700K, 3000K, 3500K, 4000K
- **Colors / Finishes:** 12 standard; others by request
- **Optics/Beam**
  - Integrated Philips/Lightolier Optics
  - 17°, 22°, 34°, 60°
  - **CBCP –** 12,350
  - **Adaptors**
    - LOL
      - (Juno, Halo)



SCAN ME

LIGHTOLIER
by signify
3D printed lighting

Low Bay Series – Small & Large

Shade options

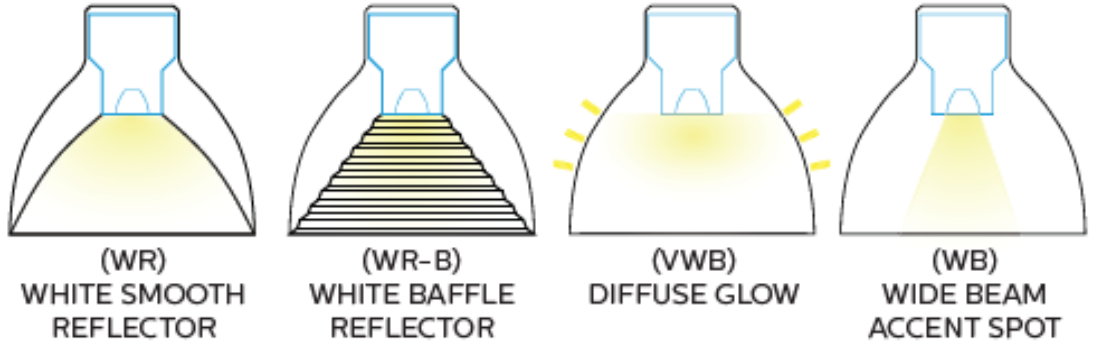
- Color: Outer: 18 / Inner: 7
- Size: Large 16” / Small 12”

- **Textures**
  - Outer Shade: Opaque: 2 / Transparent: 4
  - Double Shade: 3: Smooth, baffle, floral
    - **Optic options:**
      - *Single shade only*: Med Beam accent 25°, Wide Beam Accent 36°, Very Wide Beam 60°, Diffused 84°
      - Double shade: Smooth Reflector, Diffused only 60° standard, other optics ETO

SCAN ME

- **Lumens:** 1,000, 1500, 2000, 2700, 3800, 4500, 6000, 7500
- **CCT:** 2700K, 3000K, 3500K, 4000K; 90 CRI

Over 870K+ unique combinations



LIGHTOLIER
by signify
3D printed lighting

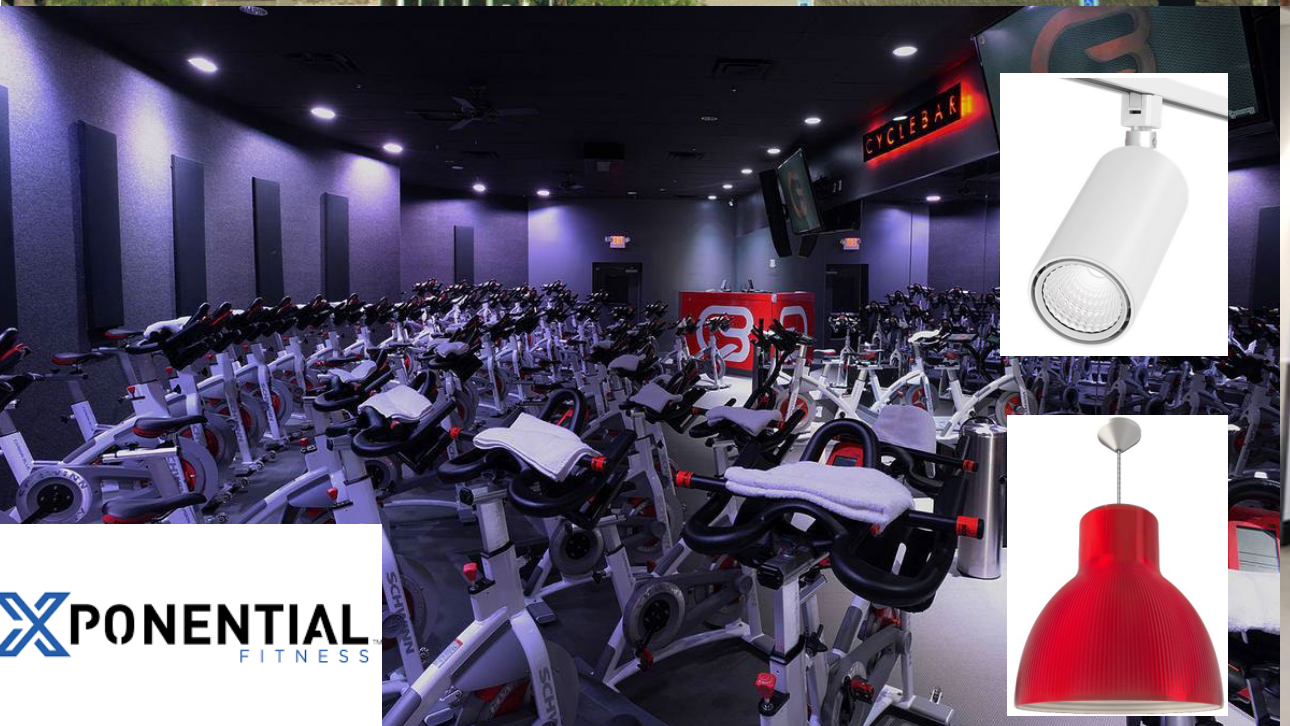
Decorative Pendants – RD Series

From 20K options to 170K combinations!

- **Shape**
  - Adding new “Cone” shape
    - Allows logo custom print
- **Color options**
  - From 10 options to **27** ***STANDARD*** options!
    - Not including bespoke colors
- **Texture**
  - Five new options
- **Mounting**
  - Track, GU24
  - Disk – Cylinder option
  - Color in same color as shade option

SCAN ME

3D Printing | Customer Win's



XPONENTIAL FITNESS

Lightolier 3D Printed Lighting

Lightolier Marketing Material

Other Lightolier material to be updated

- Lightolier.com
- Lightolier Application guide
- Hospitality /Grocery guide
- Lightolier Product Selected guides (*Track, Cylinders, High Bays*)
- Pricing Sheets
- Case Studies
- Selected Video Clips
- Agent line cards

SCAN ME

LEDALITE

NatureConnect

by signify

Nature Connect: The right light at the right moment

Day Rhythm

dynamic lighting throughout the day
following the rhythm of the sun

Natural Light Scenes

for different activities and spaces

Energize

Relax

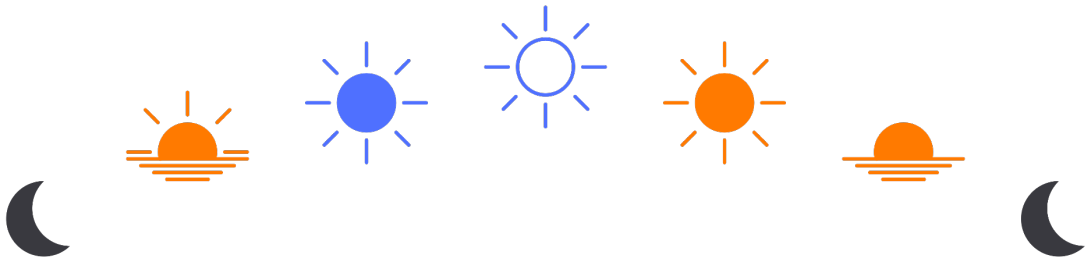
Present

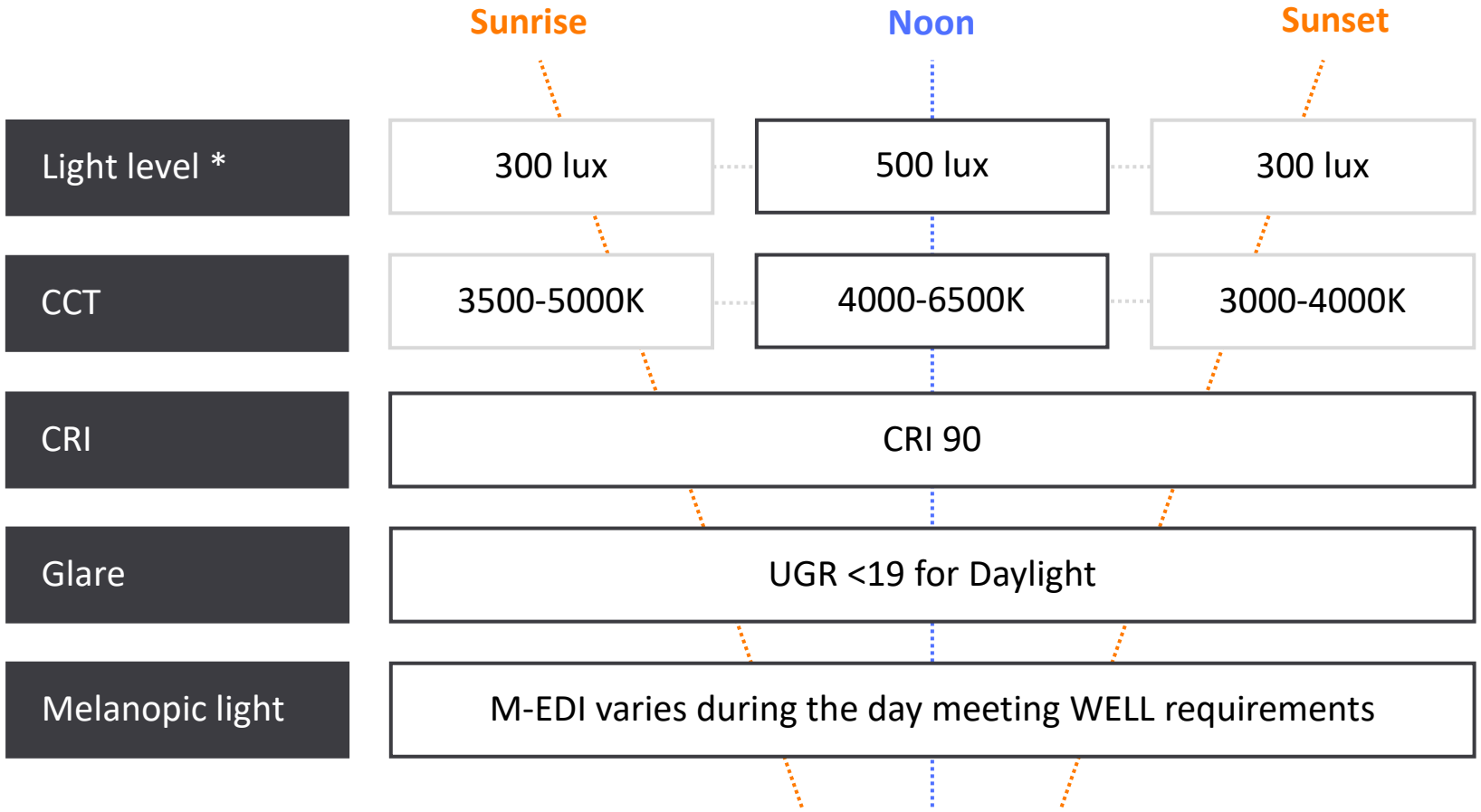
NatureConnect Specifications

The circadian rhythm is optimized for the user's wellbeing while meeting the applicable lighting standards.

The light fits:

- Activities & purpose of spaces
- Users, their personal preferences and needs
- The characteristics of the space and amount of natural daylight
- Organization rhythm





* Light levels refer to average maintained

NatureConnect supports WELL Certification

The International WELL Building Standard continues to grow its reach globally, accelerating the adoption of a worldwide culture of health and wellbeing.

NatureConnect supports reaching the required number of points in the categories Light, Mind and Movement.

INTERNATIONAL WELL BUILDING INSTITUTE™

LIGHT

Light features

Max 11 points

MIND

Mind features

Max 2 points

MOVEMENT

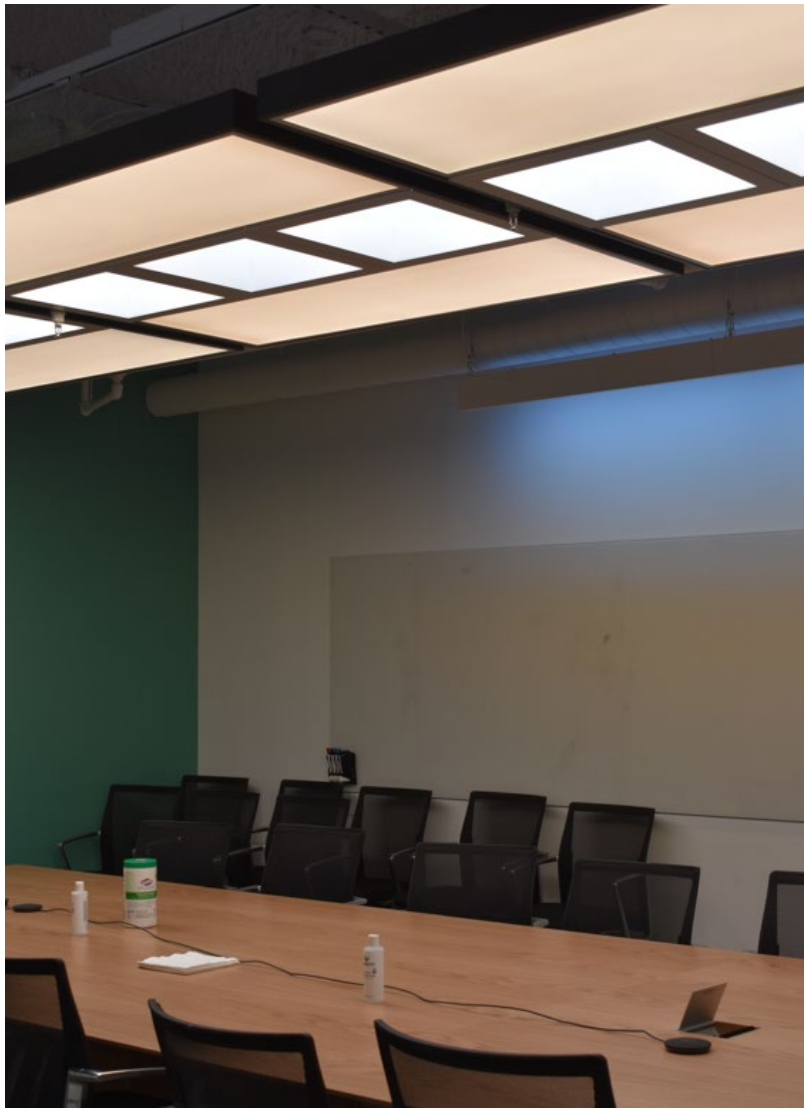
Movement features

Max 1 point

signify

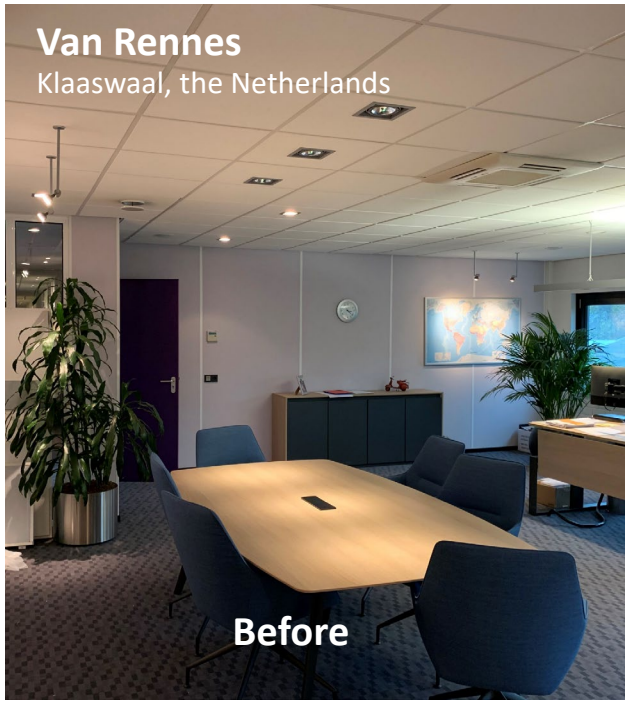
NatureConnect in the new Signify US HQ, Bridgewater

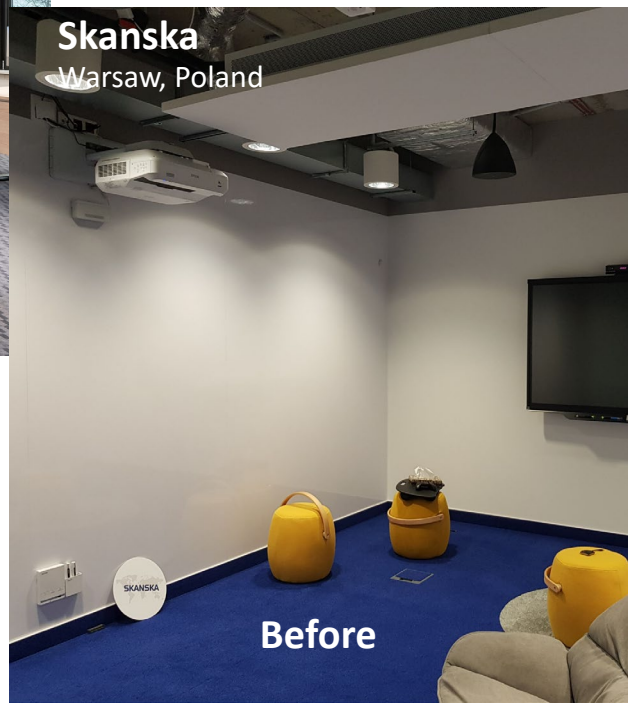
Conference Room

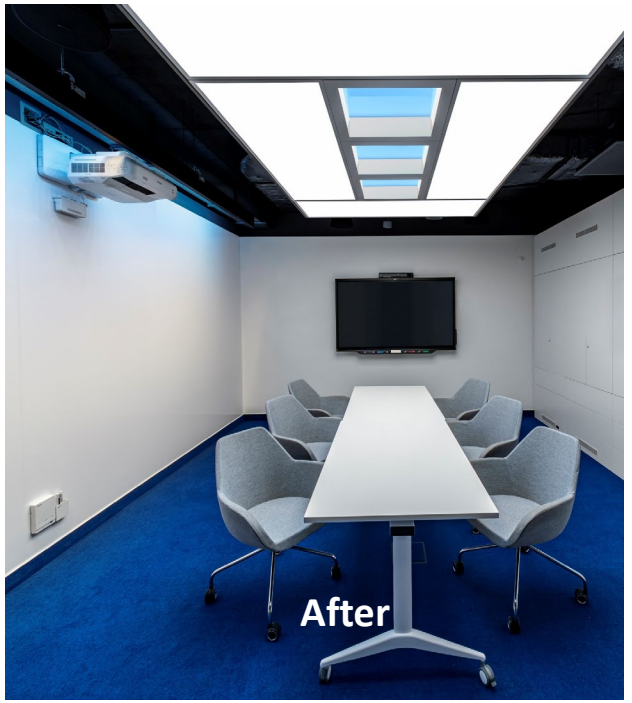


ⓢignify

NatureConnect installations around the world

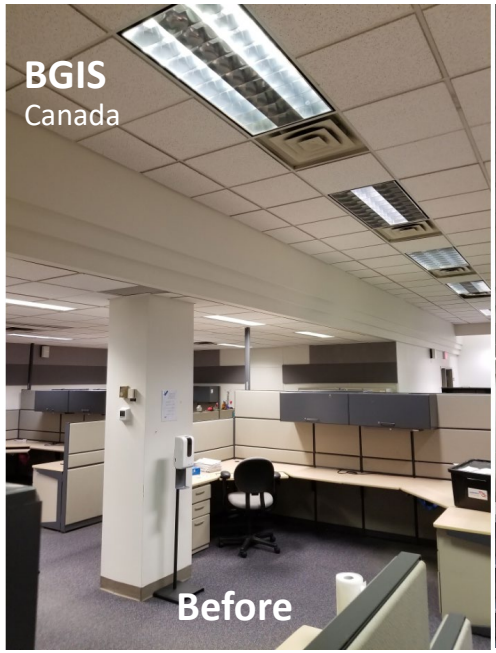


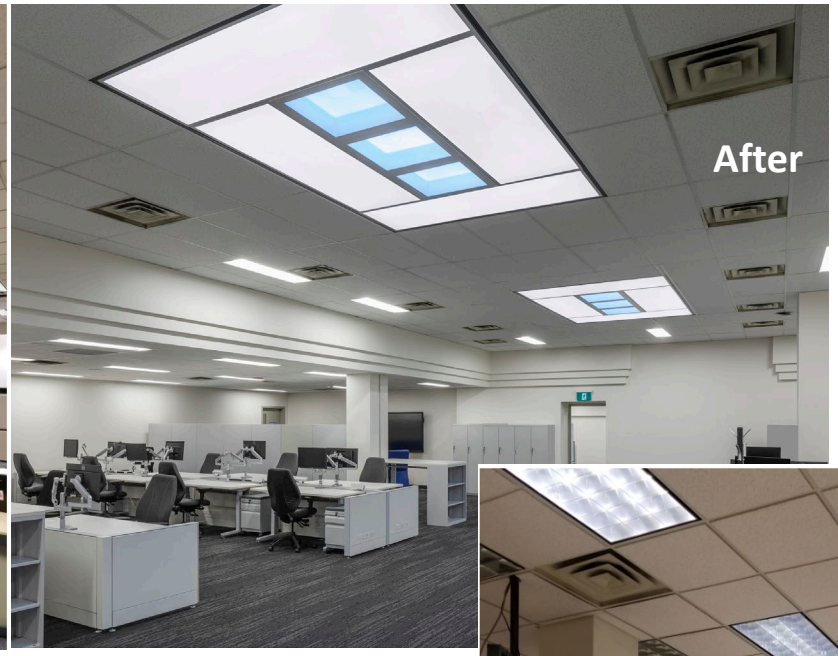


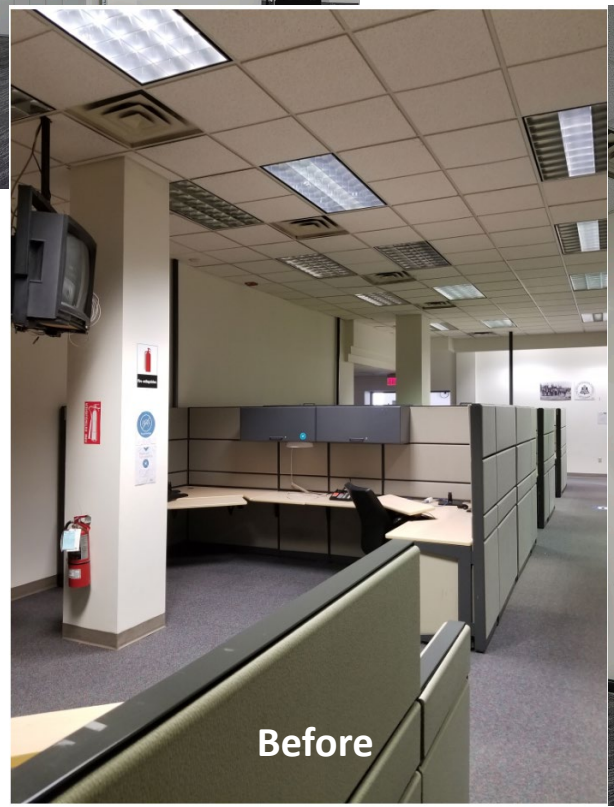


signify

NatureConnect installations around the world







ALKCO

UV-C Luminaires

©signify

Why use UV-C as disinfectant?

Reduce risk of exposure for office workers and visitors

Make office workers and visitors feel better protected

Enable business continuity by reducing disinfection cycle time

Prevent excessive spending on chemical sanitizers

3. ENHANCE AIR FILTRATION AND CLEANING using the central HVAC syst in-room air cleaning devices.

nstall properly sized MERV-13 air filters or the highest rated MERV filters that the HVAC system can ac
Close off any gaps around air filters to minimize air moving around them instead of through them.
Use portable air cleaners to increase air cleaning rates in areas where air flow and central filtration are ins

- Select devices that are appropriately sized for the space in which they will be used. Consider ENER certified products. If noise is a consideration, look for a product with lowest perceived sound levels
- As a temporary measure, do-it-yourself air cleaners can also be built from HVAC filters and box fa

ncrease ventilation and/or filtration in areas with higher emission of airborne particles and aerosols (e.g. afeterias, or choir/music rooms at schools). You can make adjustments for these areas by:

- Increasing the volume of clean, outdoor air delivery.
- Using portable air cleaners.
- Setting up extra exhaust ventilation to move air directly to the outside.

Consider an upper-room Ultraviolet Germicidal Irradiation (UVGI) system to clean the air. (UVGI syste fessional design and installation, in consultation with experts.)

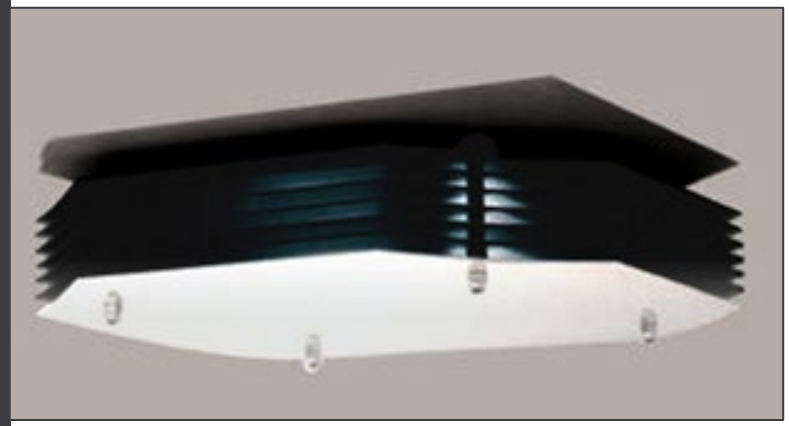
Big News!

- EPA and White House clarifications on Air Filtration and cleaning spending

UL Certification Compliance

Ensuring a safe application

Underwriters Laboratories has developed a set of standards solely for the purpose of establishing requirements for the safe and effective installation and operation of UV-C luminaires and solutions.



Testing requirement : The equipment shall be offset from its intended mounting surface angle by 1 degrees whenever such an offset is likely to produce a more severe test result

UL 1598 Safety Certified Germicidal UV system

Compliance on measurement technique to ensure safety

- ✓ Measurement in accordance with IEC 62471
- ✓ Defining the risk group as per IEC TR 62471-2
- ✓ Guidance on minimum mounting height
- ✓ Peak emission value irradiance measurement to assist installers with site planning.
- ✓ Requisite labeling and installation instructions.
- ✓ Guidance instructions on installation, operation, maintenance, and personal protective equipment for service personal in line with UL regulations
- ✓ Specify installer site planning responsibilities.

Products

Air

UVC upper air Ceiling mount

UVC upper air wall mount

Surface

UVC Strips

UVC Highbays

Controls for Surface

Equipment

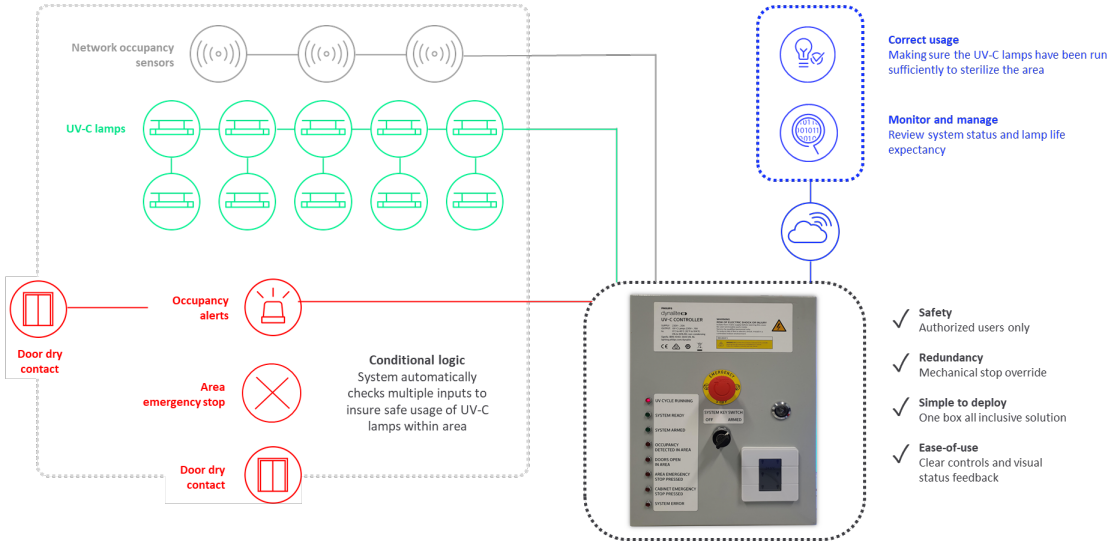
UV-C Chambers

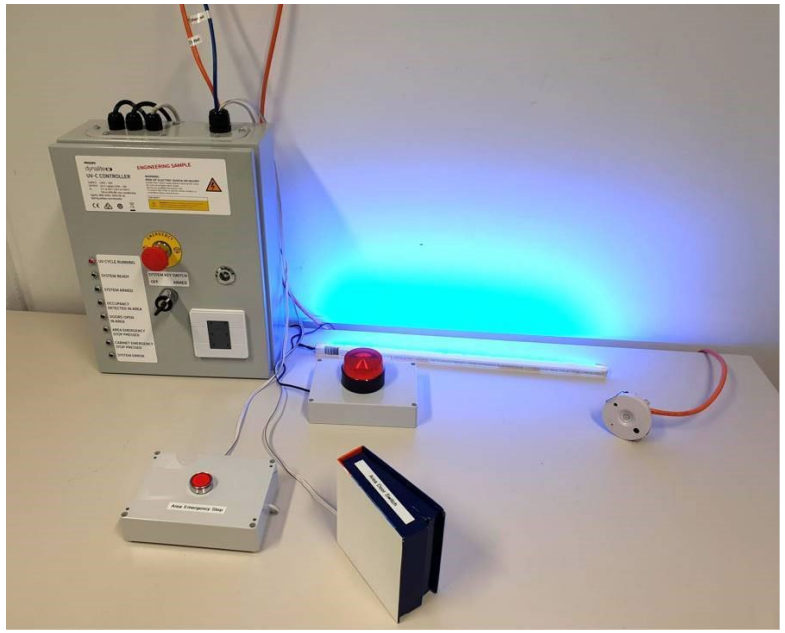
Control Solutions

Control systems

- Dynalite UV-C control system ensures that an **authorized operator** can manage the UV-C solution for optimal protection.
- By incorporating **multiple mechanical and network safeguards,** the control system provides confidence that the UV-C devices will be operated in a proper way and that the appropriate UV-C dosage is applied.

Early Proposal - Total System architecture





Protection

- Constant monitoring to ensure that no occupant will be directly exposed to the UV-C lamps
- Ensure that the correct conditions have been met for an authorized user to begin the UV-C cycle

Redundancy

- Mechanically isolated switches ensure the automated system cannot self-trigger a cycle and that - if required - an emergency stop button will cut power to the UV-C lamps
- The system checks its own network sensors and inputs to ensure that no network device has gone off-line which would lead to a false indication of occupancy status

Simple to deploy

- A single box solution
- Use of industry standard dry contact inputs reduce complexity of installation
- Network sensors are configured for self-discovery so no need for any on-site configuration

Ease of use

- The control cabinet gives a clear info on the status of the different input conditions
- The only requirement is to set the disinfection time via the Antumbra Display panel mounted on the outside and key operation to begin the cycle; All other process are automated and monitored

Monitor and Manage

- All network messages are being tracked and stored; Any issue, such as run time of the lamps, can be traced and the data can be used for preventative maintenance and re-lamping activities

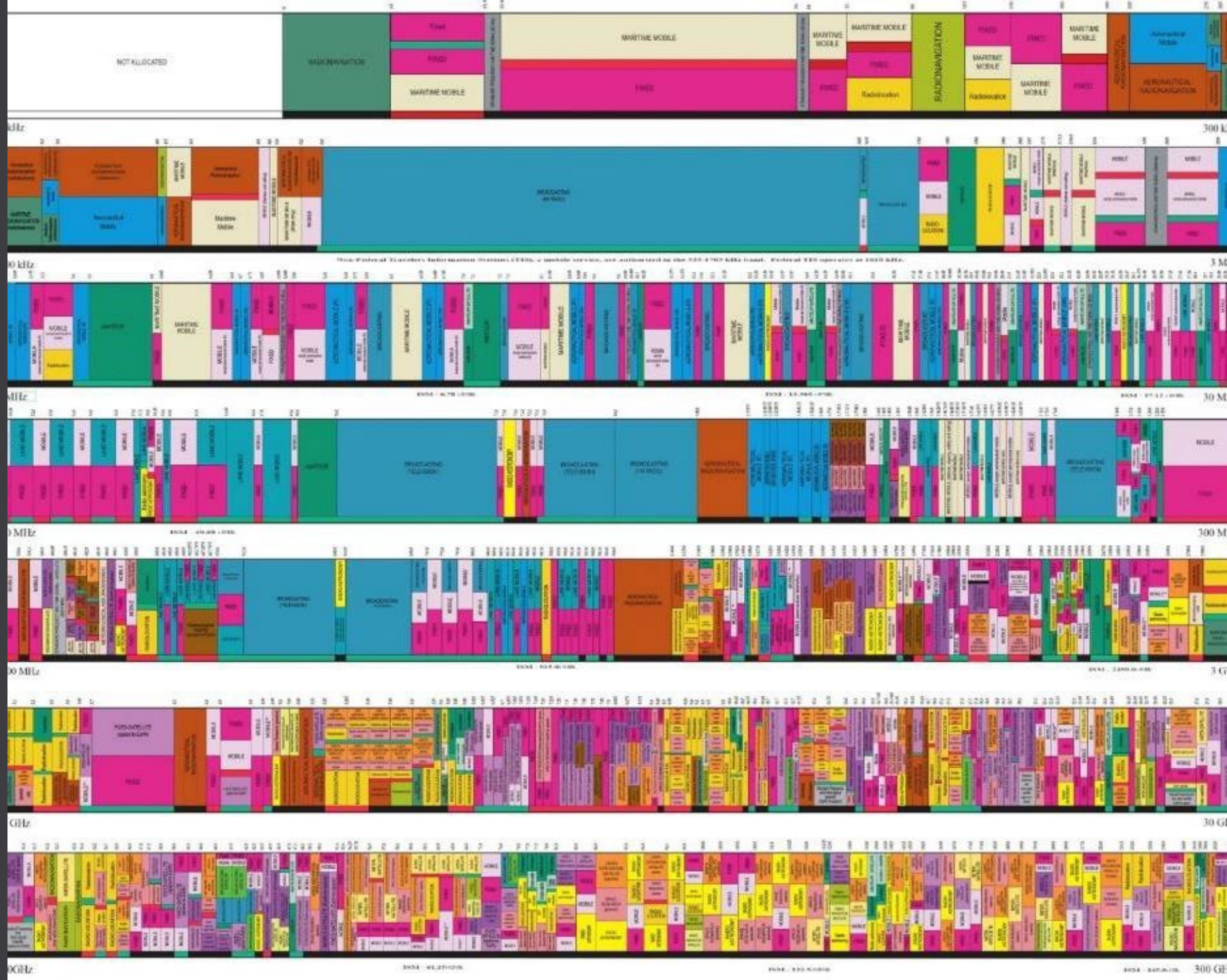
Correct usage

- The UV-C lamps must run for a pre-described time to ensure that full disinfection of an area has taken place
- An automated system can ensure this and report back if there has been any issues in performing the full duty cycle

PHILIPS dynalite

trulifi
by signify

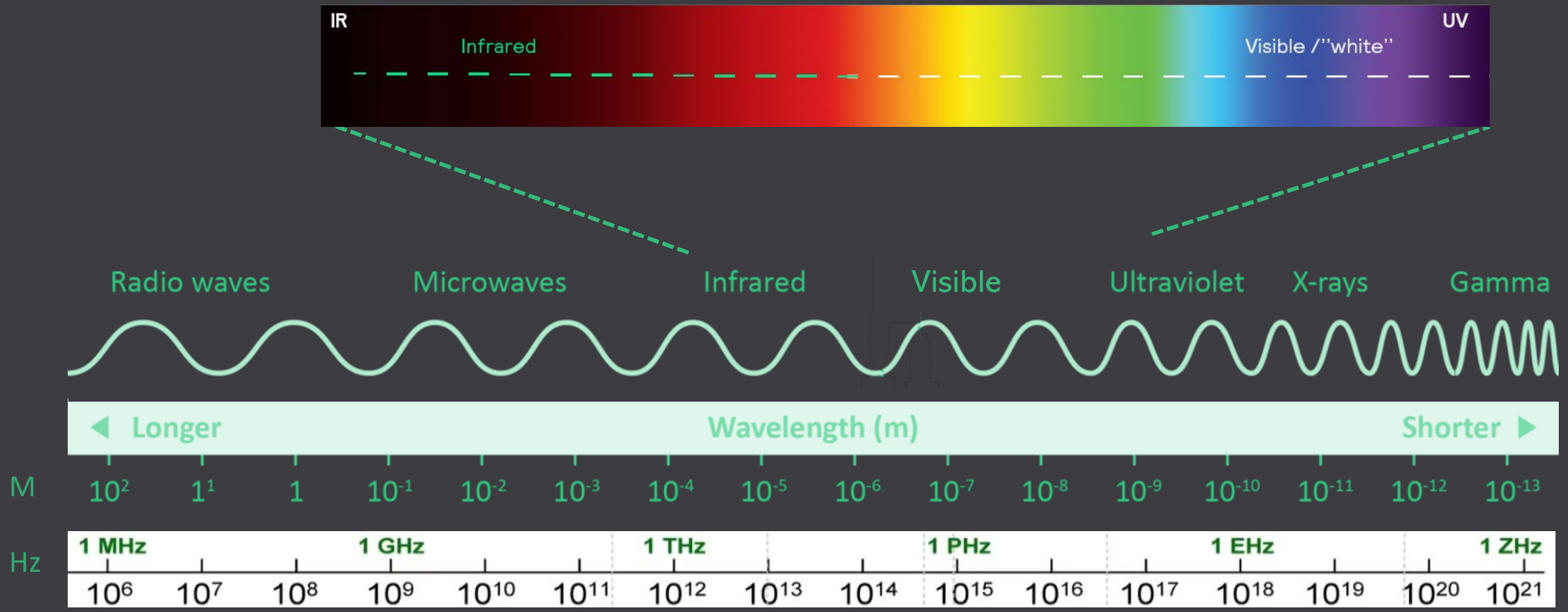
The radio spectrum does not provide enough room to grow.



On top of that there is a growing concern on security using radio-communication

signify

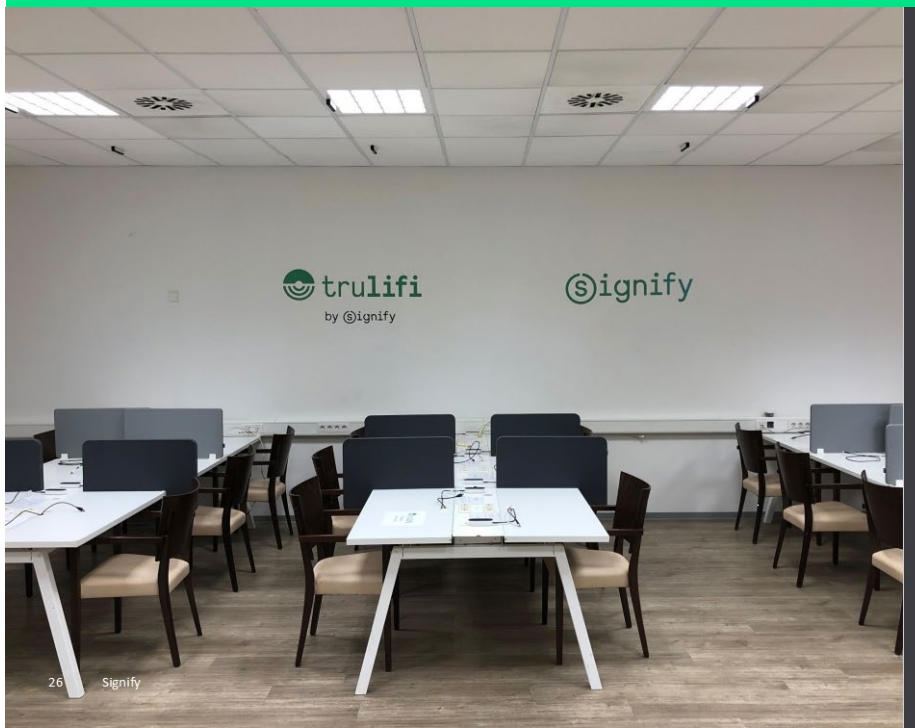
Lighting can provide additional spectrum to communicate



ⓢignify

TruLifi: Expanding data bandwidth through light communication

- **Secure**
  - We want to work wireless but privacy is crucial for our business. LiFi offers a strict definition of your communication area.
- **Reliable**
  - We want a stable data rate per user despite the number of users. LiFi ‘offloads’ WiFi in high traffic areas.
- **Fast**
  - Cloud solutions, bigger files, more online meetings require a fast high quality connection.



HSV Hamburg

“We opted for LiFi given the increasing demand for bandwidth from journalists using our press center. For them a reliable wireless connection is everything. Now they have good quality light to write their stories along with a reliable, fast and highly secure wireless connection,” said Daniel Nolte, segment leader area organization & infrastructure at HSV.

signify

We leverage our lighting luminaires and infrastructure to accommodate many more functions

*EvoGrid Recessed LED 2x4

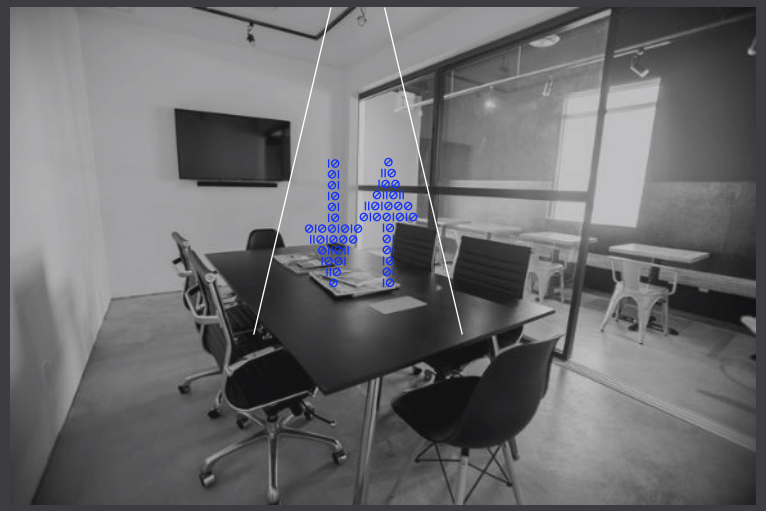
Day-Brite CFI by signify

LEDALITE by signify

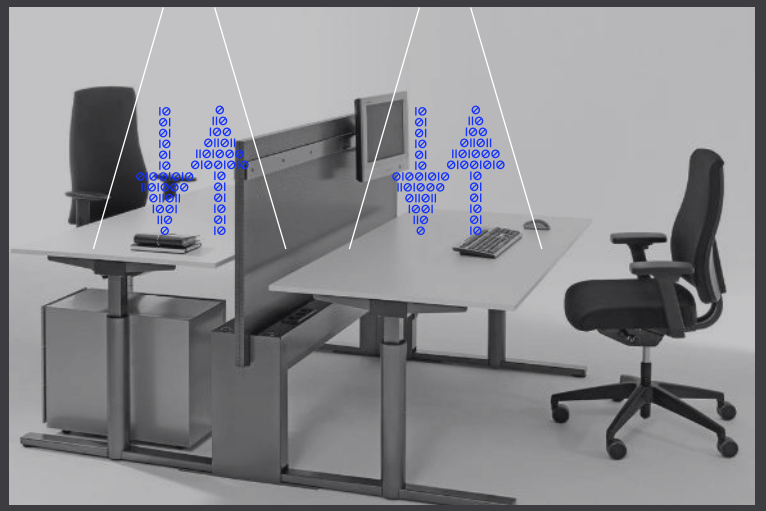
Interact IoT Platform

trulifi

Use Case: **Office**



Meeting room



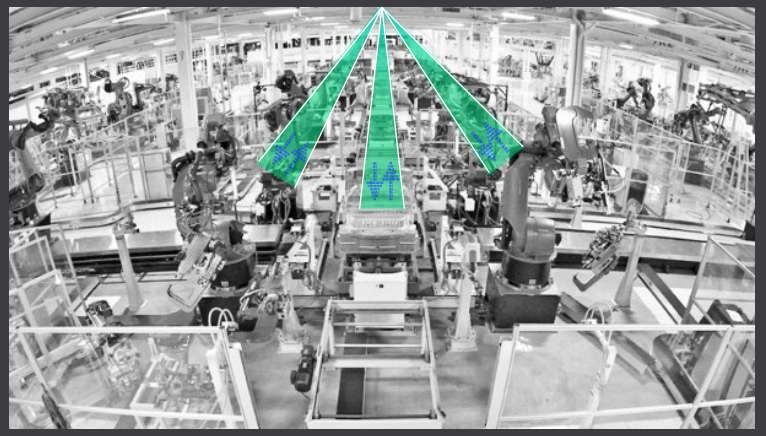
Workplace

Guest waiting area

signify

Use Case: **Industrial**

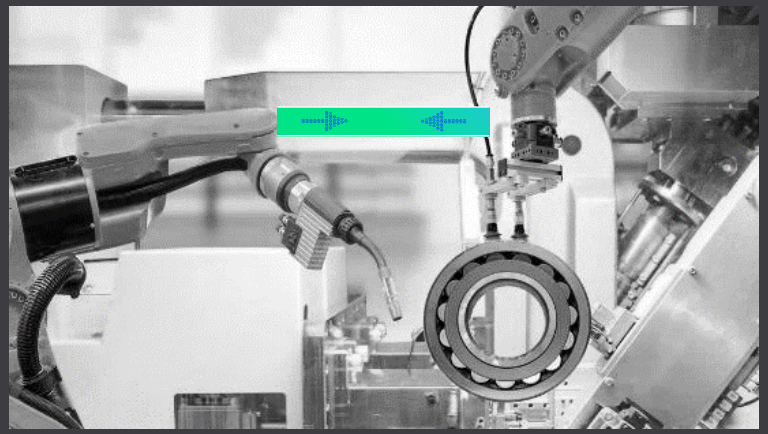
Work stations



Network to robots

High ceiling

RF hostile environments



Machine to machine

(Fast) moving objects

signify

10-day Quick Ship

EvoGrid Recessed LED
2x2 & 2x4, 3500k, 2 lumen pkgs

4-6 Week MTO

EvoGrid Recessed LED
(other configurations)

SilkSpace

Shine

TruGroove recessed

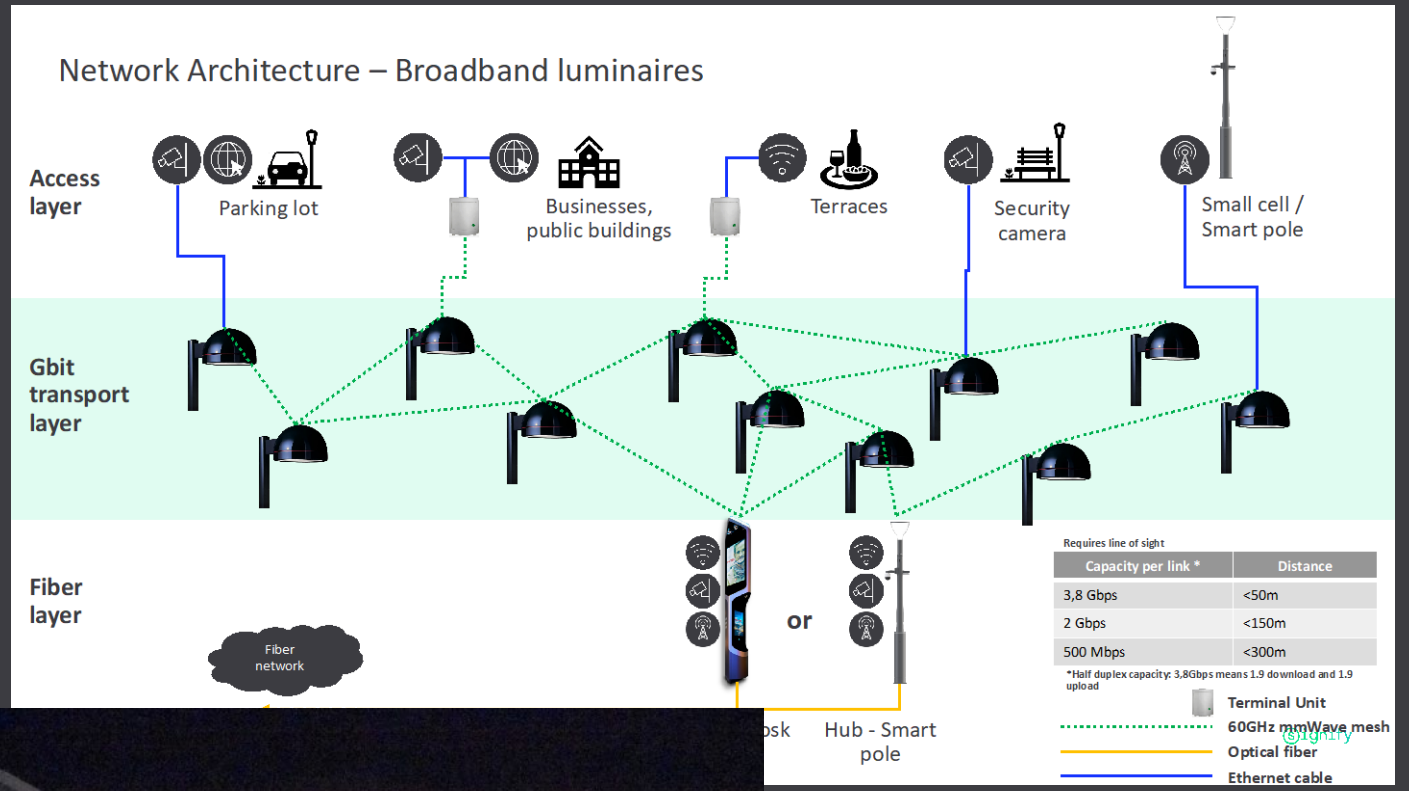
BrightSites
by signify

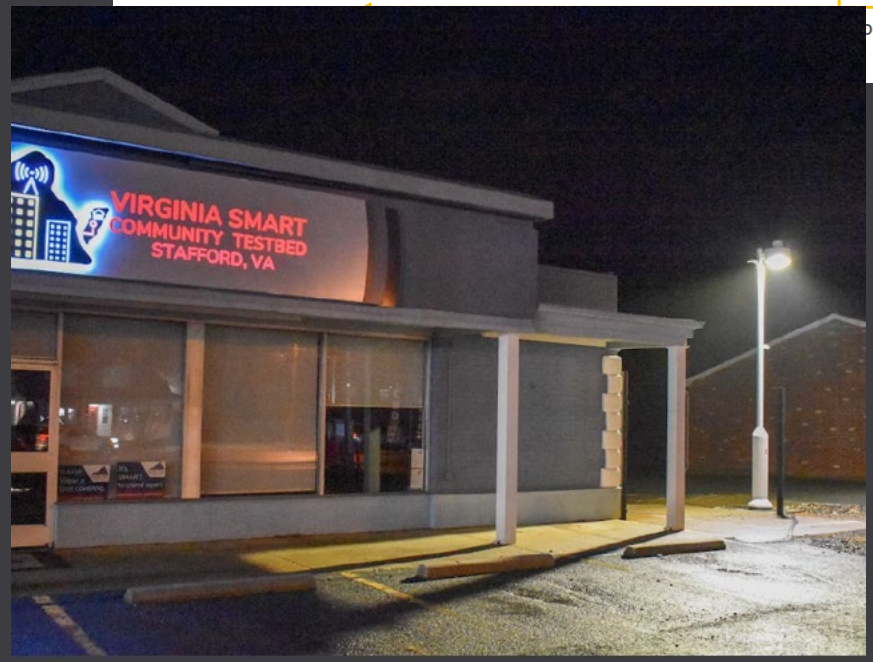
BrightSites

Smart grid of the future

- IOT Smart Pole Hub to help close connectivity gap
- Broadband Luminaires on existing poles to provide 60GHz “wireless fiber” backbone to support:
  - Public Wi-Fi
  - Fixed Wireless Access to MDUs
  - IOT Cameras
  - Environmental Sensors

- **Connectivity densification**
  - 4G, 5G, Wi-Fi offloading and shared spectrum
  - Integrated cloud-based communication and IoT services platform
- **Scalable urban infrastructure**
  - Standard light infrastructure enables rapid expansion
  - Repeatable solution to fit multiple market needs simultaneously





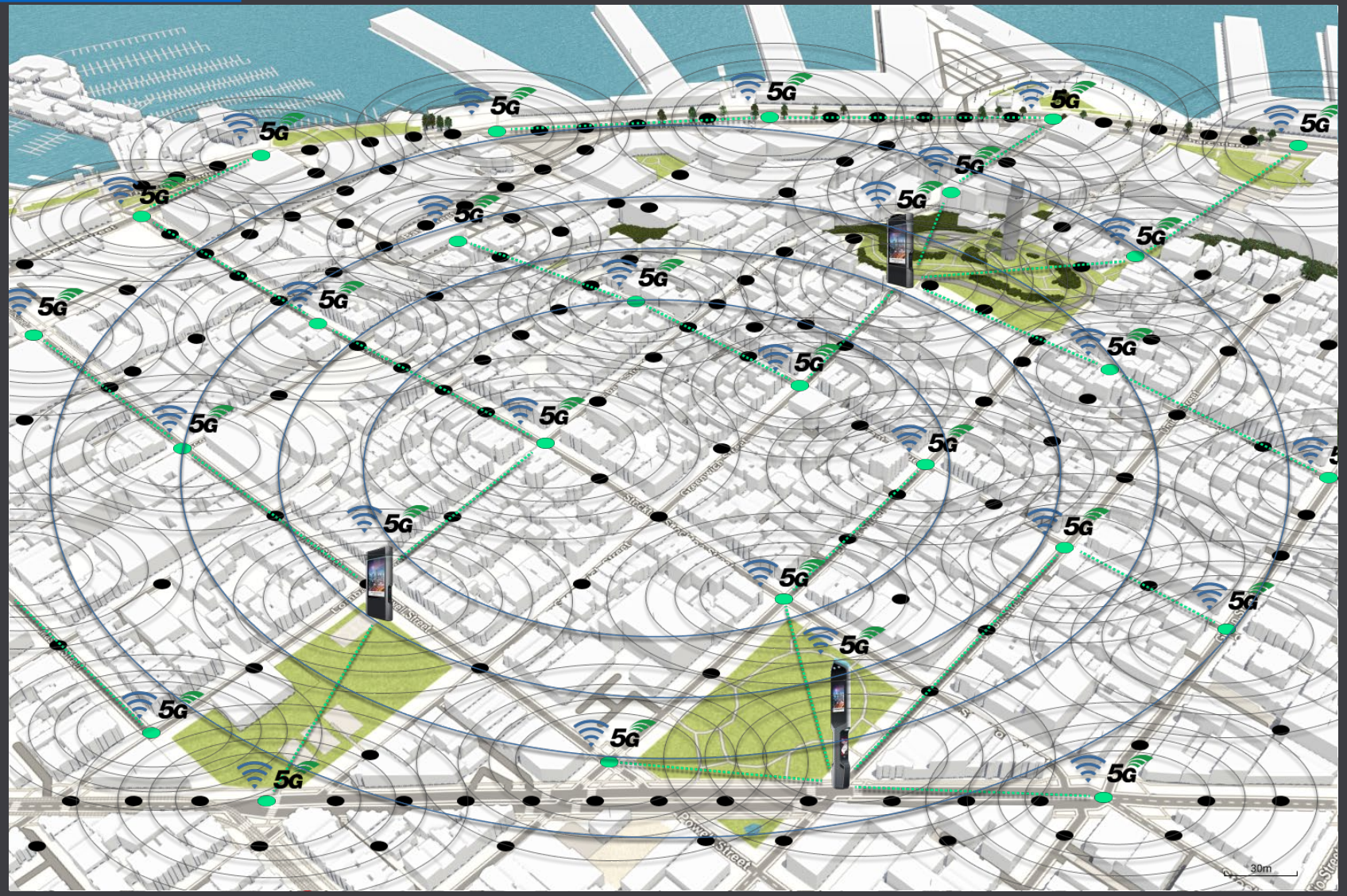
Smart Community Testbed

signify

With our solution we enable the connectivity grid of the future

https://youtu.be/aaHrMlyLpoM

1. Light pole grid
2. Smart Hub
3. Upgrade pole
4. Activate pole
5. Meshed network



signify

Our solution complements the “Lighting as IoT” vision

interact
Smart power metering, data brokerage and infrastructure health monitoring (incl. 3rd party), Infrastructure marketplace

BrightSites by signify

APIs

City Management SW Platform

Connected Lighting

- Existing sensor based connected luminaires
- Offer narrow band IoT services through Interact

Hub

- Fiber hub with intelligent services
- Telco compliant architecture (edge compute)

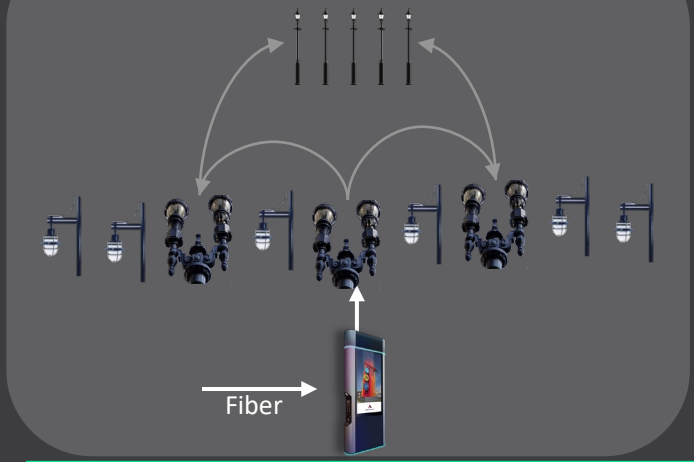
Broadband luminaire (NEW)

- Wireless fiber (802.11ay) broadband services luminaires
- Integrated telco grade power distribution and surge control

Smart Pole

- Small cells (RRU with 5G / CBRS / WiFi)
- Neutral host for battery units

Network Architecture Example



Benefits

- 50% lower deployment costs
- New revenue stream through activated light poles
- Scalable and aesthetic e2e solution
- Operational efficiency (Interact)

Division 26 – Electrical/Lighting/ Lighting Controls

Division 26 & 27 – Communications

signify

Brightsites Luminaires with Gbit technology: Portfolio

signify

Global Trends

- We are indoors a lot
- Employee, student/parent, and the public expectations
- Connectivity is king

signify

signify

Genlyte & Global Brands

We provide the solution to every lighting need

Lamps / Ballasts / Drivers / LEDs

PHILIPS

ADVANCE by signify

Controls & Connected Systems

interact

PHILIPS dynalite

COLOR KINETICS

Technology brands

BrightSites by signify

trulifi by signify

GENLYTE SOLUTIONS

Outdoor Luminaire Brands

LUMEC by signify

GARDCO by signify

HADCO by signify

Stonco by signify

Indoor Luminaire Brands

ALKCO

Day-Brite CFI by signify

CHLORIDE by signify

LEDALITE by signify

- NatureConnect by signify

LIGHTOLIER by signify

- LIGHTOLIER by signify
- 3D printed lighting

Effective 2022, Global technologies shall be marketed under spec grade brands