

The role of lighting in renovation

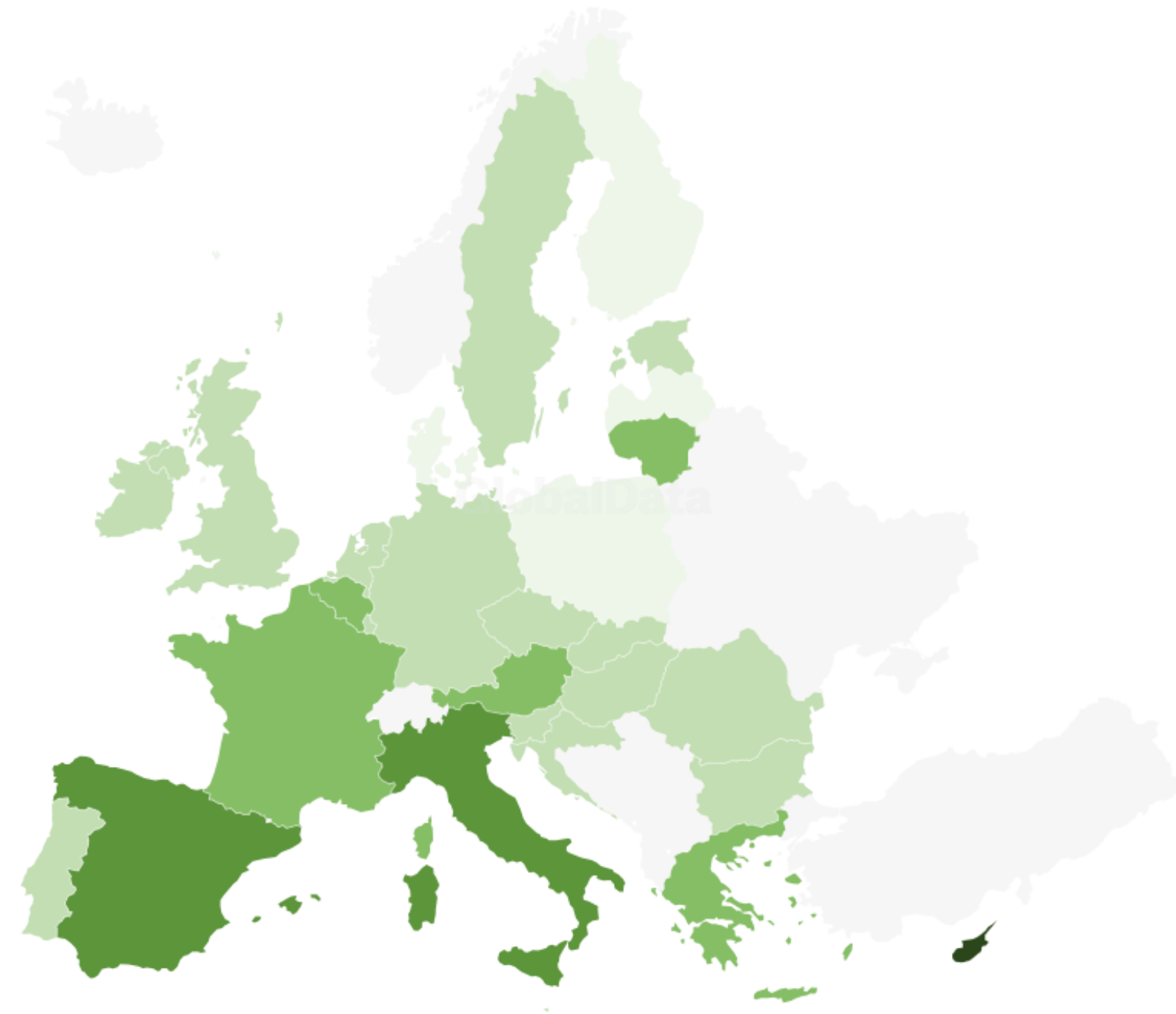
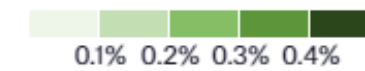
Peter Thorns, Head of Strategic Lighting Applications, Thorn Lighting

Get Started

Renovating Europe's Buildings – The problem

Deep building renovations languish at 0.2% per year and need to rise to 3% by 2030

Deep energy renovation in residential buildings, average, 2012–16



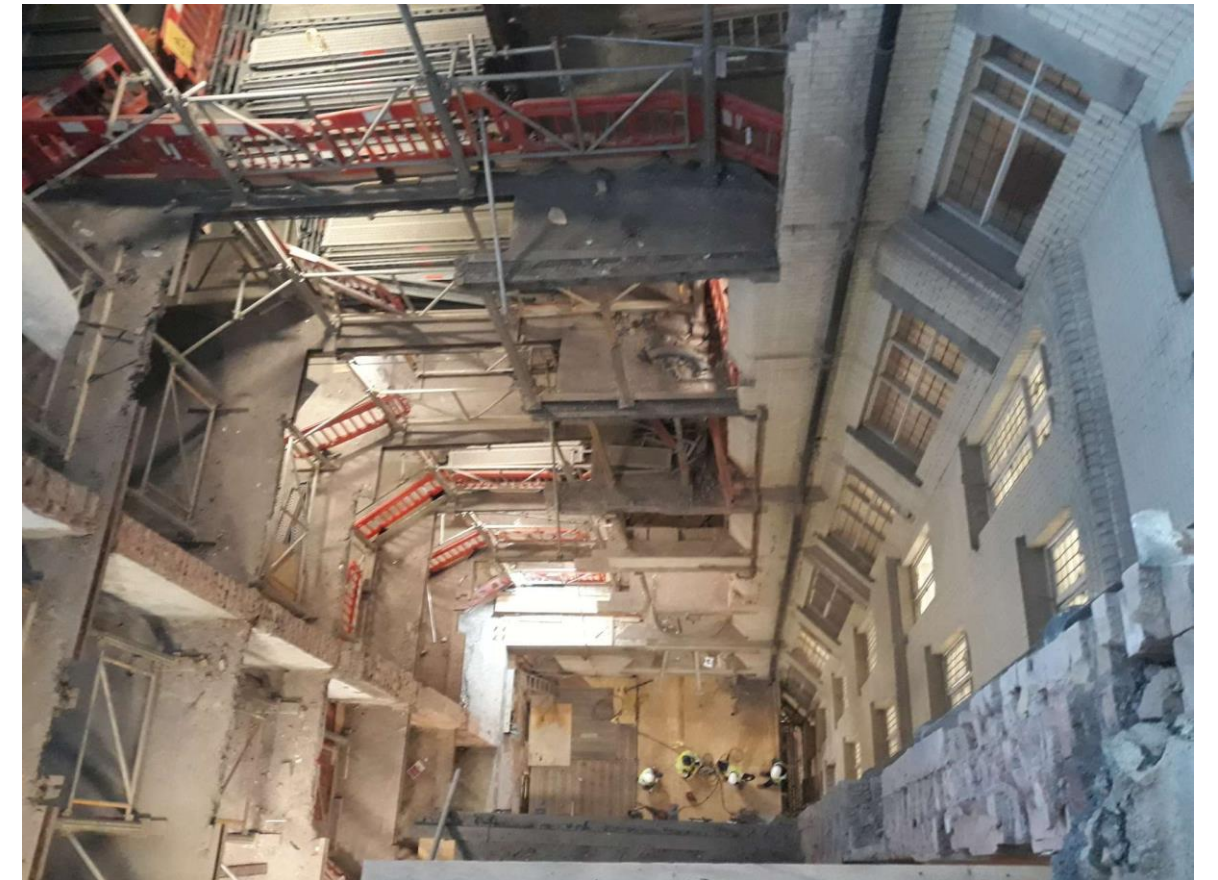
Deep renovations comprise those that result in energy savings of at least 60%.

Source: European Commission • [Get the data](#)

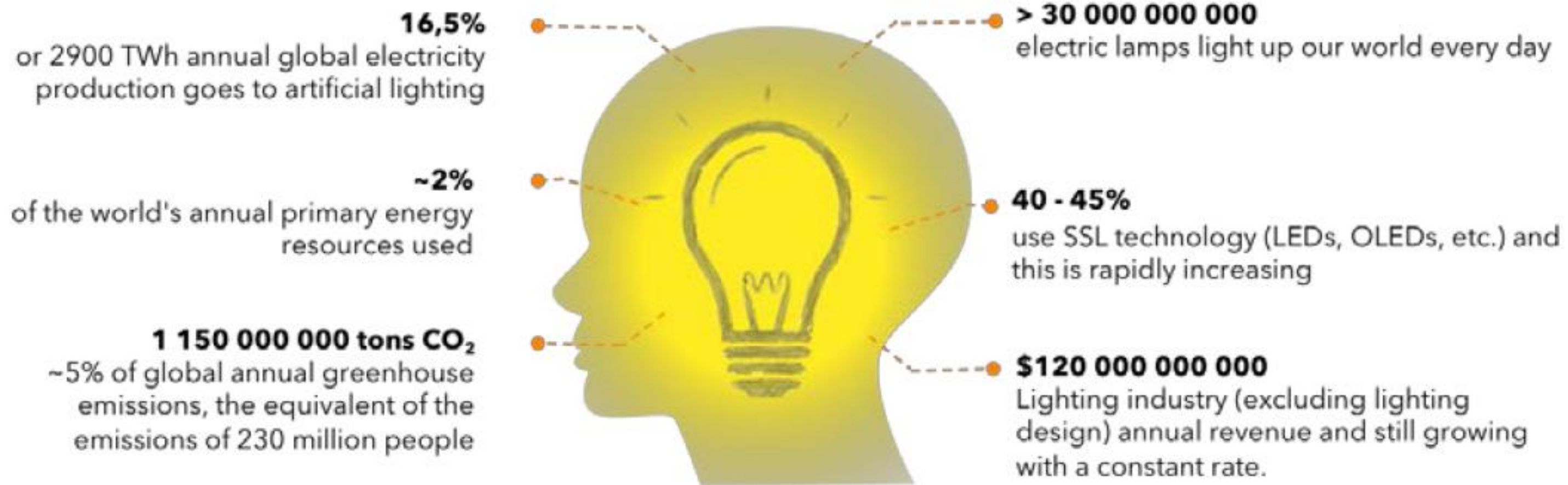
Renovating Europe's Buildings – The problem

For the UK to meet the carbon trajectory set out in the UKGBC's Whole Life Carbon Roadmap, an overall 59% reduction in energy consumption in the office sector is required by 2050.

The Better Buildings Partnership's (BBP) Real Estate Environmental Benchmark (REEB) illustrates the scale of the challenge for the sector, with the latest 2020 snapshot revealing that 97% fall short of the UKGBC 2035– 2050 target energy use intensities and 65% fall short of the 2020–2025 targets.



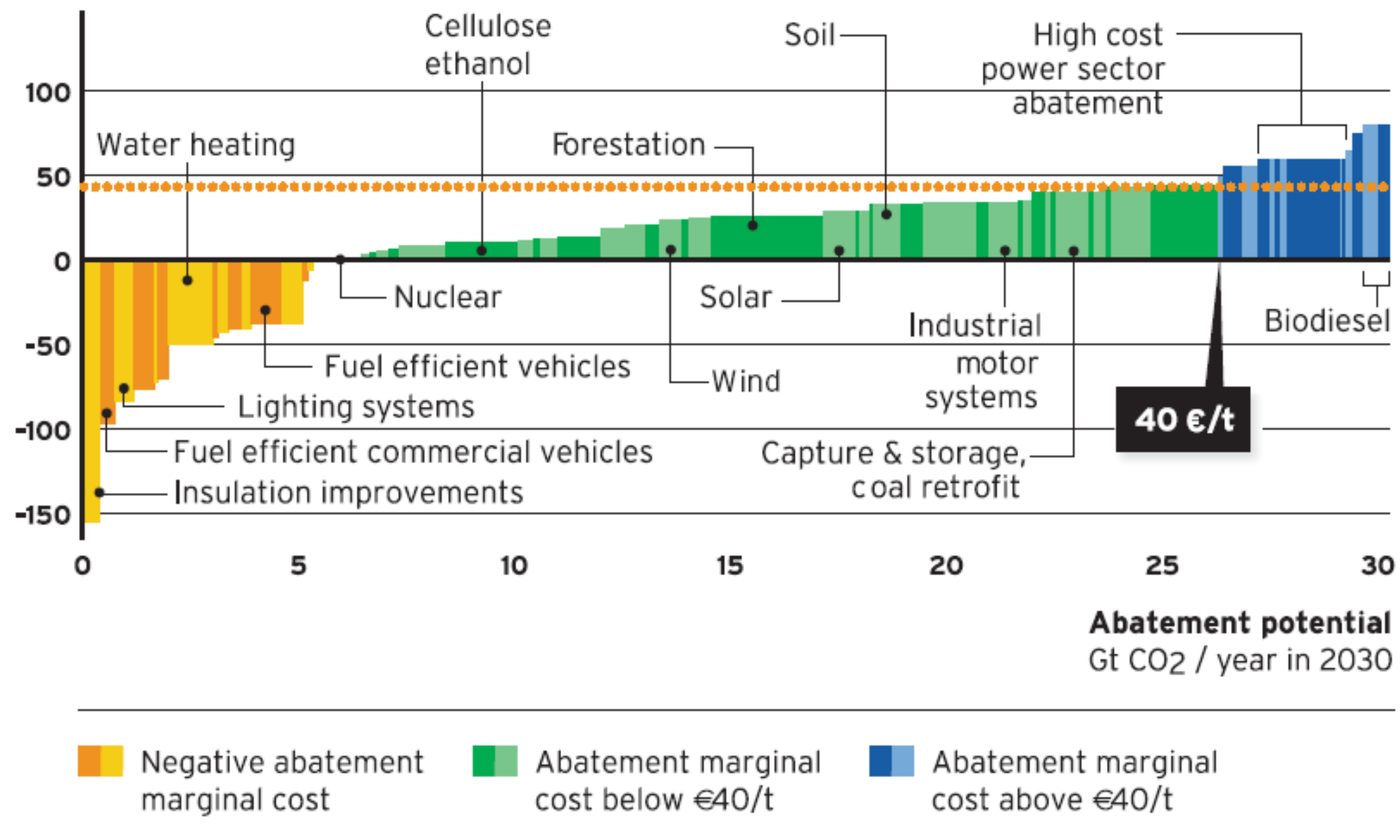
Renovating Europe's Buildings – The problem



Artificial lighting has a significant impact on energy, the environment but also on everyday life and the global economy

Renovating Europe's Buildings – The potential of lighting

Marginal cost of abatement – examples
€/t CO₂



Renovating Europe's Buildings – Lighting Renovation

Converting to LED lighting is one of the fastest ways to act and delivers the highest savings of any replacement technology of up to 80 per cent.

If all lighting in Europe was switched to LED, €65bn could be saved on energy bills and 51 million tonnes of CO2 saved.

This would free up enough electricity

to power 47 million heat pumps

or

to power 55 million electric vehicles
for a year



Source: Signify Case Study: Energy efficiency and the climate emergency

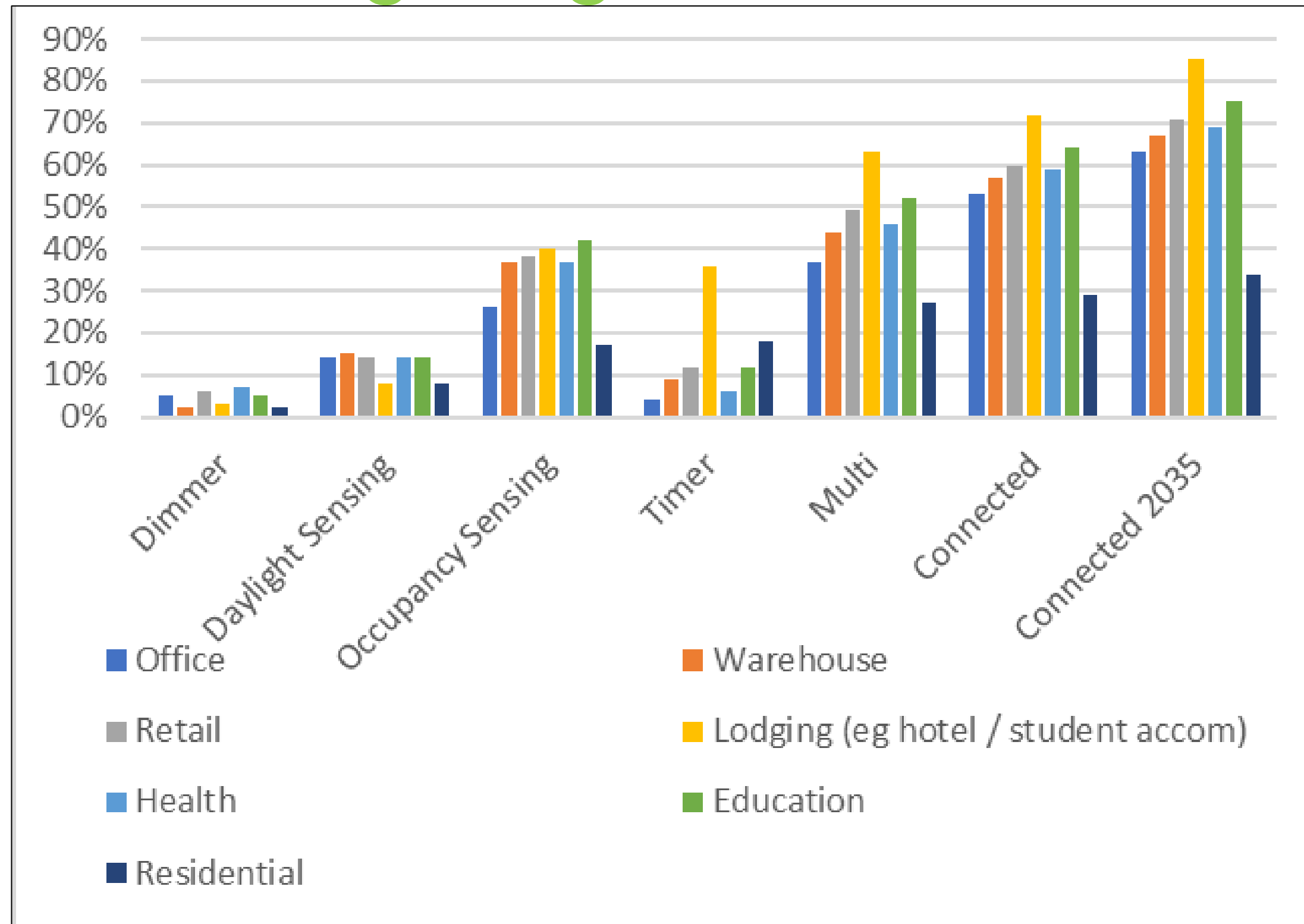
Renovating Europe's Buildings – Lighting Controls

The values in the table below, taken from a paper¹ comparing 240 studies of energy savings using different technologies, give an indication of typical average savings from different lighting control strategies.

Strategy	Definition	Average Savings
Presence/Absence (occupancy control)	Lighting changes automatically with presence of people	24%
Task Scene Setting (personal control)	Occupant control of light levels	31%
Daylight (daylight control)	Lighting changes automatically with daylight levels	28%
Task lighting	Light levels automatically tuned to task needs	36%

¹ Lighting Controls in Commercial Buildings
A. Williams, B. Atkinson, K. Garbesi, E. Page, F. Rubinstein
LEUKOS Vol 8 No 3 January 2012

Renovating Europe's Buildings – Lighting Controls



Source: US DoE: Energy Savings Forecast of Solid-State Lighting in General Illumination Applications; Dec 2019

Renovating Europe's Buildings – Lighting Controls

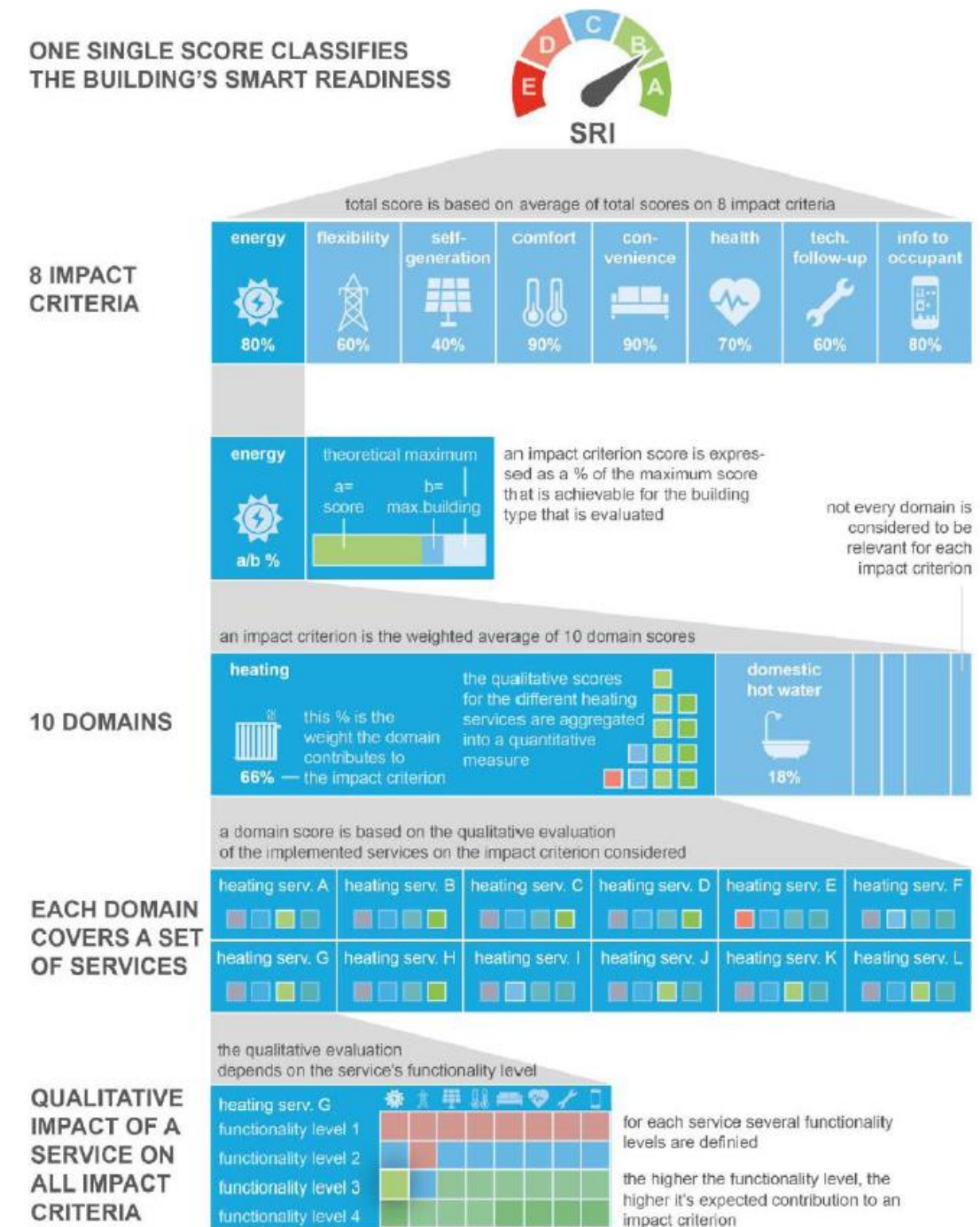
Member States shall lay down requirements to ensure that by 31 December 2027, where technically and economically feasible, non-residential buildings with an effective rated output for heating systems, air conditioning systems or systems for combined space heating and ventilation or systems for combined air conditioning and ventilation of over 290 kW **are equipped with automatic lighting controls. The automatic lighting controls shall be suitably zoned and capable of occupancy detection**'.

Member States shall lay down requirements to ensure that by 31 December 2029 ...non-residential buildings with an effective rated output for heating systems, air conditioning systems or systems for combined space heating and ventilation or systems for combined air conditioning and ventilation of over 70 kW...

Source: Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the energy performance of buildings (recast) – Analysis of the final compromise text with a view to agreement

Renovating Europe's Buildings – Lighting Controls

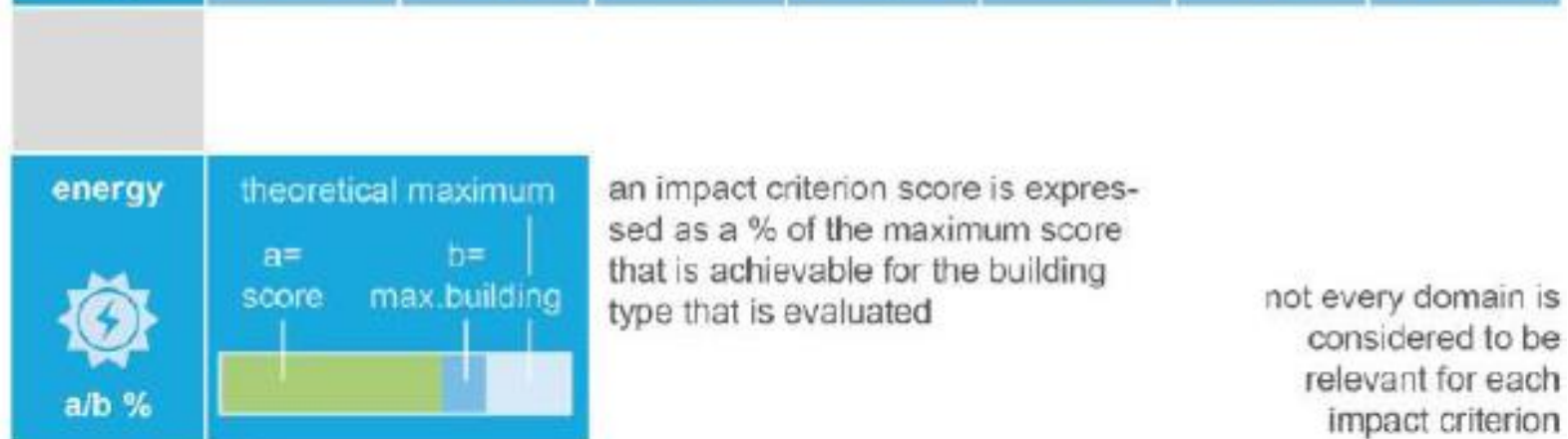
...the Commission shall, by 30 June 2027, adopt a delegated act ... requiring the application of the common Union scheme for rating the smart readiness of buildings ... to non-residential buildings with an effective rated output for heating systems, air-conditioning systems or systems for combined space heating, air-conditioning and ventilation of over 290 kW.



Source: Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the energy performance of buildings (recast) – Analysis of the final compromise text with a view to agreement

Renovating Europe's Buildings – Lighting Controls

8 IMPACT CRITERIA



10 DOMAINS



Domains

1. Heating
2. Domestic hot water
3. Cooling
4. Controlled ventilation
- 5. Lighting**
6. Dynamic building envelope
7. Energy generation
8. Demand side management
9. Electric vehicle charging
10. Monitoring and control

Renovating Europe's Buildings – Lighting Controls



Lighting Services

1. Occupancy control for indoor lighting
2. Mood and time-based control of lighting in buildings
3. Control artificial lighting power based on daylight levels

Renovating Europe's Buildings – Lighting Controls

Table 1.7

Total world. Estimated sales of LED-based lighting and connected items by country or geographic area, 2020

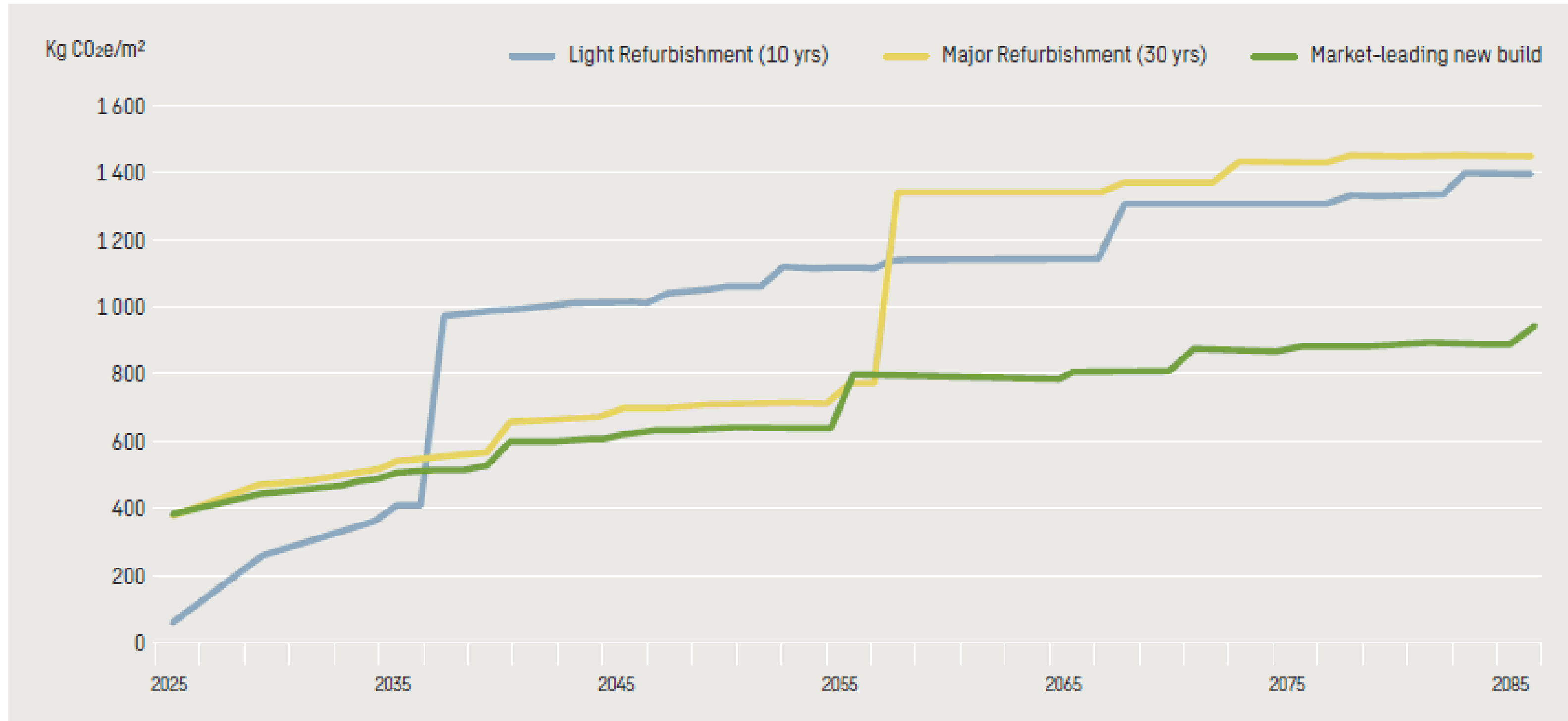
	Total LED-based Lighting Market * at Factory Price USD Million	% Share of Connected Lighting on total LED Lighting Market	Connected Lighting Market at Factory Price USD Million	Connected Lighting Market at Retail Price USD Million
North America	19,135	9.0	1,722	2,239
Central and South America	1,959	3.0	59	76
European Union (27) + UK, NO, CH	15,767	7.5	1,183	1,537
Russia, Serbia, Turkey and CIS Countries	2,167	4.6	100	130
China	17,346	9.5	1,649	2,144
India	2,472	3.0	74	96
Japan	6,705	8.0	536	697
Asia and Pacific	5,978	5.0	299	389
Middle East and Africa	2,572	4.6	118	154
Rest of the World	1,909	3.0	57	74
TOTAL WORLD	76,010	7.6	5,797	7,536

Source: CSIL processing

(*) Total LED Lighting Market includes LED Lighting Fixtures Market + LED Lamps Market

Source: CSL LEDs and the worldwide market for connected lighting

Renovating Europe's Buildings – Benefits of renovation

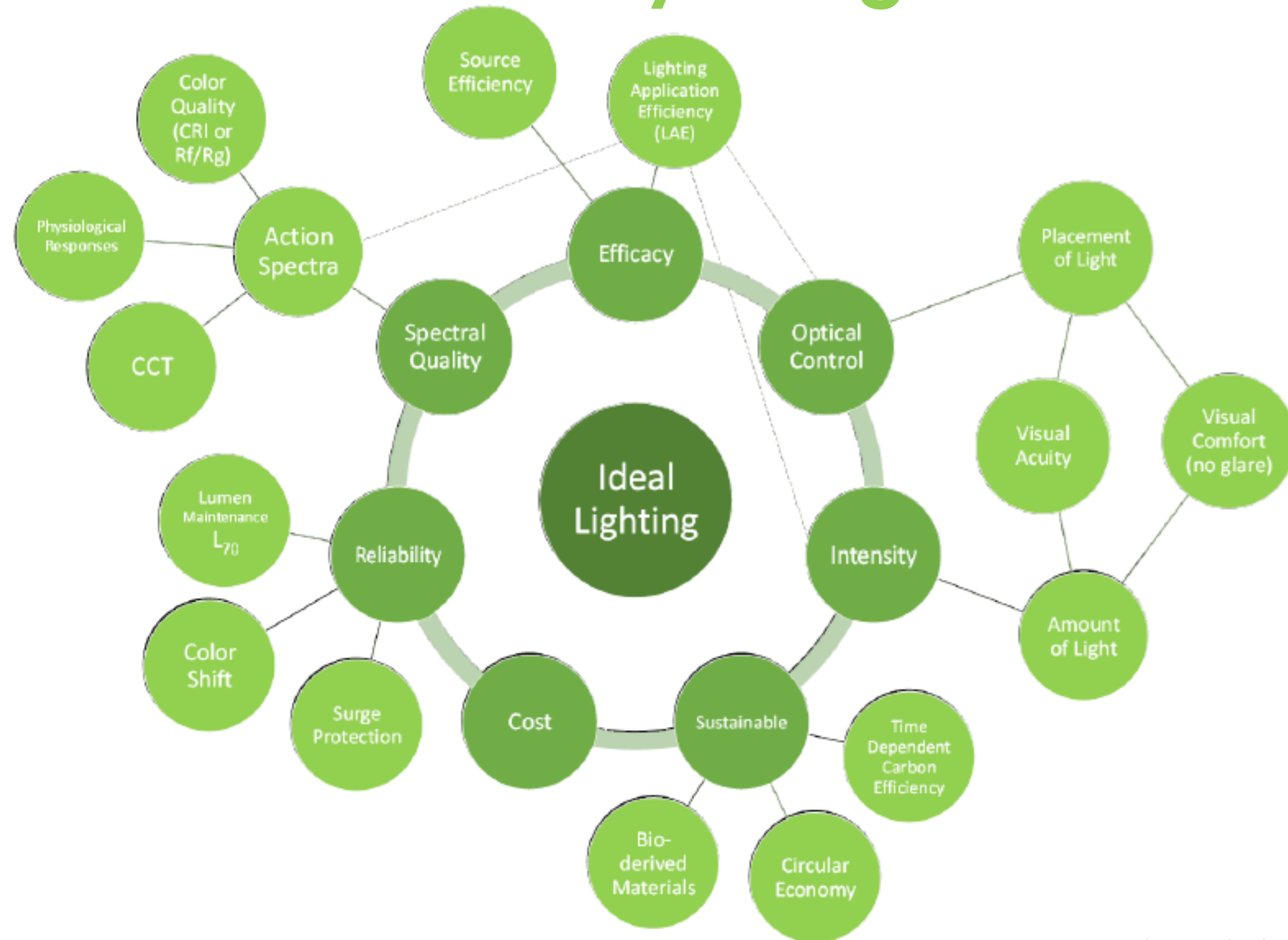


Renovating Europe's Buildings – Quality of Light



Renovating Europe's Buildings –

Quality of Light



Source: US DoE: 2022 Solid-State Lighting R&D Opportunities

Renovating Europe's Buildings – Quality of Light

Light has an effect on



Vision

Sight, safety and orientation



Body

*Alertness, cognitive performance
and sleep/wake cycle*



Emotion

Mood, energize and relaxation

Each lighting application has its own specific needs



Office



Factory



School



Elderly
Home



Hospital

We need the **right light** for our
activities at the **right place** at
the **right time**



Wake up



Energize



Concentrate



Relax



Sleep





LIGHTINGEUROPE
THE VOICE OF THE LIGHTING INDUSTRY

THANK YOU



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