

A young woman with long dark hair, wearing a blue top, is smiling and looking towards the right. A young man with dark hair, wearing a black and white striped shirt, is smiling and looking towards the right. They are standing in front of a large, illuminated building at night. The background is dark blue with warm yellow lights from the building.

PHILIPS

Lighting

The LED lighting revolution

A Triple-Win for Climate, Economy
and Society in the 21st Century



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Huge savings

despite growing demand for energy

- Three global challenges
 - Population growth
 - Urbanization
 - Rise of the middle class
- By 2030 these global trends will lead to an estimated 35% increase in number of lightpoints worldwide.
Enormous energy savings can be achieved by accelerating renovation of the installed base, and leapfrogging to efficient and connected LED lighting technologies for new cities and buildings.



From a linear to **circular economy**

In recent decades we have refined a model for business and society where the priority is to pay the lowest initial cost.

The result is a linear economy, which extracts and consumes huge amounts of resources (energy, material, food and water).

The expansion of our linear society is underpinned by our use of Gross Domestic Product (GDP) as the preferred indicator and measure of progress.

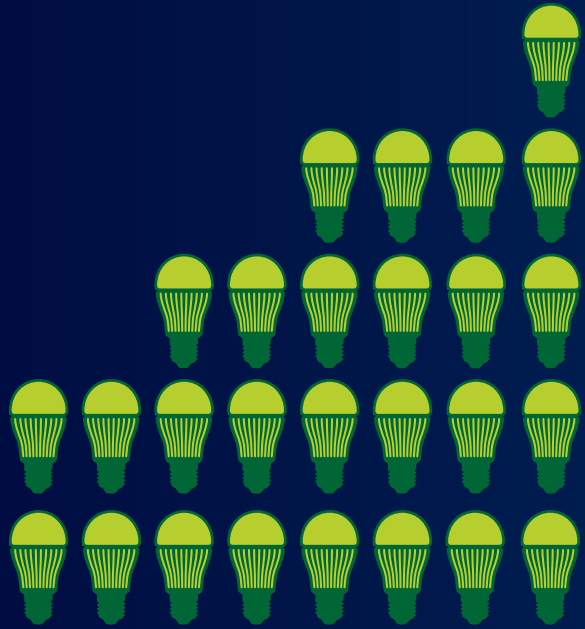
Global trends

35%

increase in lightpoints compared to 2006

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Due to population growth, urbanization and the rise of the middle class, the total number of lightpoints throughout the world is projected to **grow by 35%** by 2030.



Growth in demand **for lighting**

The world needs energy and services which enable well-being of both people and planet... That means:

- **The world needs more light** to cope with increased demand
- **The world needs energy-efficient light** to reduce the economic and environmental impacts
- **The world needs smart, connected light** to maximize the benefits

LED lighting provides a viable solution

Four drivers for change

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1 value proposition

LED lighting can now be used in all applications. It can also be connected to lighting management systems and adjusted to produce new lighting experiences. This makes it an energy-efficient lighting technology to drive sustainable development.

Lighting currently consumes **15%** of the world's electricity.



LED lighting energy savings potential

Even with the huge growth in lightpoints by 2030, LED lighting can deliver huge savings (compared with baseline 2006 figures):

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Region	€ bn	Carbon mt	# Power Plant
Global	272	1400	1250
EU (incl. RCA)	85	198	267
NA	48	301	273
Latam	24	34	94
Asia	71	601	403
Middle East & Africa	42	266	212



A decline of
1400 million
tons in carbon
emissions per year



€ 272 billion
in energy savings
compared to 'business
as usual' per year



A saving of
1250
power plants compared
to 'business as usual'

The lighting share of global electricity consumption has evolved **from 19% in 2006** (before the lighting market transition, after Philips called for a global agreement to phase out incandescent light bulbs) **to 15% in 2014**, and is projected to further decline **to 8% by 2030**

Benefits beyond efficiency

Next to energy efficiency, cost savings and reduced carbon emissions, LED lighting provides additional benefits beyond efficiency. With lighting levels that can be adjusted and no compromise in light quality, it can be used to create:



- Safer roads and streets



- More productive offices



- More liveable cities and attractive public spaces



- More patient-friendly hospitals

Barriers to the Switch

Lack of awareness

– people are simply not sufficiently aware of the many benefits of good quality LED lighting.

- Lighting is not widely recognised as a key to energy efficiency
- People don't see the electricity costs associated with lighting
- They are unaware of new, energy-efficient lighting technologies
- Often decision makers are not lighting experts

Financial

Although energy-efficient lighting technologies cost a little more initially, they offer attractive levels of payback and save large amounts of both energy and money during their lifetime.



Next steps to **acceleration**

- **Technology exists:** there's no need to delay adoption
- **Policy frameworks:** renovation of existing lighting systems combined with green public procurement
- **Financing:** unleash public private financing mechanisms
- **Communicate tangible benefits:** impacting voting and buying behavior



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Over the years, the use of conventional light bulbs has been steadily decreasing as people become more aware of the benefits of energy saving alternatives.

Conventional vs...

Global sales of incandescent lightbulbs have fallen sharply, from a stable level of **12 billion** pieces per year in 2006. Collective efforts to adopt more efficient lighting have halved the annual market for incandescent light bulbs to **6 billion pieces**.

...LED lighting

In years to come we will see the total disappearance of 19th century incandescent light bulbs - the end of the first mass electric appliance! - to be replaced by 21st century efficient **connected LED lighting systems and technologies.**



The broader economic benefits of energy efficiency

20 Global trends (population growth, urbanization, rise of the middle class) lead to an annual growth in energy demand of 3%.

At the same time, our society is only making gains in energy efficiency of close to 1.5% more efficient per year.

If we double the rate of energy efficiency improvement to 3% per year, we can unlock significant economic benefits.

Doubling the rate of energy improvement provides

- **€2300 / US\$ 2500 billion** reduction in annual fuel bill by 2030
- **reduction** of household energy bills by **one third**
- **More than 6 million jobs** (already by 2020)



Benefits ripe for the picking

You can make significant progress in saving energy, reducing carbon emissions and cutting costs by switching to LED lighting. By connecting LED lighting to smart controls, networks, devices and apps, Philips enables **new levels of energy efficiency, amazing lighting experiences and outstanding business outcomes**. To fully realize the potential, accelerated renovation of urban infrastructure and buildings is needed. Cities, states and regions can take the lead by partnering with progressive companies. Energy efficiency and connected LED lighting systems and solutions are fruits lying on the ground waiting to be picked up. Philips looks forward to working with you on your lighting projects.

The LED and Digital Revolution

Technology and business
model transition



Leading EE lighting
Solutions

Connected LED
lighting integrated
in infrastructure
Eco-systems

Offering Lighting
Products

- Analog - Lamps
- Stand-alone - 'Dumb'
- Products - Replacement sales

- Digital - LEDs
- Connected - 'Smart'
- Systems & Services - Projects



Transition from analog to digital:

- Switch from lighting replacement products to financing and leasing lighting as a service

This will reap not only the direct economic benefits of lighting but also the benefits beyond lighting fully in line with the transition from a linear to a circular society.



Real life Madrid case

Madrid is advancing its city infrastructure by swapping 100% of its street-lighting with Philips LED and other Philips energy-efficient lighting technologies.

This street-lighting renovation project is the largest in the world to date. This renewal project delivers a 50% saving in energy compared to the old installation.

Total

LED savings potential per region

Metric	Global	Europe	NA	Latam	Asia	MET
€ bn	272	85	48	24	71	42
M Co2	1400	198	301	34	601	266
# of power stations*	1250	268	273	94	403	212

* Average 2TWh power station



Home Lighting

LED savings potential per region

Metric	Global	Europe	NA	Latam	Asia	MET
€ bn	82	27	18	3	20	14
M Co2	437	65	116	4	166	86
# of power stations*	384	87	105	12	111	69

* Average 2TWh power station



Outdoor Lighting

LED savings potential per region

Metric	Global	Europe	NA	Latam	Asia	MET
€ bn	21	6	4	3	6	3
M Co2	109	16	22	4	46	21
# of power stations*	101	22	19	12	31	17

* Average 2TWh power station



Office Lighting

LED savings potential per region

Metric	Global	Europe	NA	Latam	Asia	MET
€ bn	49	15	6	5	14	8
M Co2	245	32	40	9	110	55
# of power stations*	221	44	36	23	74	44

* Average 2TWh power station



Retail Lighting

LED savings potential per region

Metric	Global	Europe	NA	Latam	Asia	MET
€ bn	34	9	6	7	8	4
M Co2	158	20	41	9	68	21
# of power stations*	150	27	37	23	45	17

* Average 2TWh power station



Hospitality Lighting

LED savings potential per region

Metric	Global	Europe	NA	Latam	Asia	MET
€ bn	15	6	2	0	4	3
M Co2	80	12	10	1	38	18
# of power stations*	70	16	9	4	26	15

* Average 2TWh power station



Health Lighting

LED savings potential per region

Metric	Global	Europe	NA	Latam	Asia	MET
€ bn	12	5	1	0	3	3
M Co2	60	14	7	0	25	13
# of power stations*	53	19	6	0	17	10

* Average 2TWh power station



Other

LED savings potential per region

Metric	Global	Europe	NA	Latam	Asia	MET
€ bn	58	17	11	7	17	7
M Co2	312	38	65	7	149	52
# of power stations*	272	52	59	20	100	42

* Average 2TWh power station



Policy measures; 'supply' and 'demand'

Restrict SUPPLY of least efficient products

Phase out old inefficient technologies by setting minimum efficiency and quality requirements

- Incandescent lamps
- Halophosphate TL lamps
- High Pressure Mercury lamps
- EM ballasts for fluorescent lighting

Stimulate DEMAND of most efficient products and systems

National policies and legislation promoting efficient products and systems

- Green Public Procurement
- Lighting System Legislation
- Financing mechanisms
- Energy performance targets for all buildings and neighbourhoods, combined with renovation of existing ones

Business Enablers: potential investment models

Use new business models

- Utility funding schemes
- Public Private Partnership
- Energy Service Company

Private financing

- Installment payment
- Bank loan
- Financial lease

Fiscal measures

- VAT differentiation
- Import duties
- Tax deduction

Public Funding

- Subsidies
- Economic stimulus measures

Carbon financing

- Clean Development Mechanism
- Joint Implementation
- Carbon credits
- White certificates



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