



The LED lighting revolution

A summary of the global savings potential - May 2012

asimpleswitch.com

PHILIPS

sense and simplicity



Contents

\\ The LED lighting revolution	4
\\ What is the opportunity?	5
\\ Global energy-efficient LED lighting saving potential	6
\\ Energy-efficient LED lighting saving potential per segment	8
\\ Barriers to Switch	27
\\ Potential business enablers	28
\\ Policy measures	29
\\ Triple-Win	30
\\ Notes on sources and calculations	31

The LED lighting revolution

We have reached a tipping point development of high quality light emitting diodes (LEDs). This exciting new technology can now be used for general lighting in almost all applications. This is good news for planet earth and its people's, because quality LEDs offer solutions to some of the key issues and opportunities we face today - the energy crisis, resource scarcity, climate change, safety in and attractiveness of our cities, productivity in our offices, and an enhanced sense of health and well being to name but a few. Nor should we forget that LED technology, when combined with the latest solar and battery developments, can also provide practical light for the third of humanity which currently lives without electricity.



1. What is the opportunity?

Lighting consumes a significant part, 19% of all electricity in the world.

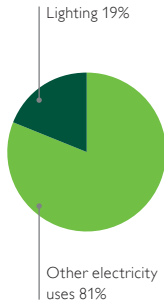
4 key issues

- Rising energy prices
 - Climate change
 - Security of resource supply
 - Economic growth
-



1 value proposition

Energy efficient lighting solutions help drive global sustainable development



source IEA

LED lighting energy savings potential

Saving potential	Global	Europe	North America	Latin America incl. Mexico	Asia Pacific	Middle East and Africa
Euro billion	128	28	40	9	36	15
Mln tonnes of CO ₂	670	98	210	24	236	102
Number of power stations @ 2TWh/year	642	141	198	46	181	76
Car emissions mln cars @ 10k mile/year	260	38	81	9	95	40

LED lighting can save on average up to 40%

...**Whereas individual programs can save up to 70-80%.**

An achievable **average energy saving of 40%** on all the lighting currently installed globally would save:



Euro 128 billion in
energy costs



670 mln tonnes
of CO₂



Annual output of
642 medium sized
power stations @
2TWh/year



260 mln car
emissions
@ 10mile/year

Home Lighting – LED savings potential per region

Saving potential	Global	Europe	North America	Latin America incl. Mexico	Asia Pacific	Middle East and Africa
Euro billion	40	9	15	1	10	5
Mln tonnes of CO ₂	214	32	81	3	65	33
Number of power stations @ 2TWh/year	202	45	76	5	50	25
Car emissions mln cars @ 10k mile/year	83	12	31	1	25	13



Home Lighting – LED lighting can save up to 80%

In 2011 around **11.5 billion incandescent lamps** were sold worldwide, of which **75% are used in homes**. The global installed base is still **67% incandescent lamps vs. 33% energy savers**.

- Philips LED bulbs offer high quality light, using 80% less energy and last more than 20 times longer than traditional bulbs.
- In 2011, Philips won the prestigious US Department of Energy's Bright Tomorrow Lighting Prize (L-prize).
- The 'L-prize bulb' is the world's brightest and most energy efficient 60-Watt equivalent replacement and closely mimic an incandescent bulb.
- Philips' LED based luminaire portfolios offer great light performance while reducing 80% energy consumption and electricity costs.

.....

Energy savings

- GLS ▶ LED

80%



Home LED Lighting – comparison of pay-back time between lamp types



- The initial cost price of a LED lamp is higher than a traditional incandescent light bulb, however, if you consider the usage of it, the payback time is 1,5 years for a product (40W equivalent) which has an expected lifetime of around 20 years.
- If we compare the costs involved for the use of a 40W incandescent (price per lamp EUR 1.50) vs a 6W equivalent LED bulb (price per bulb is EUR 9.99), the cost saving for the LED bulb is EUR 5.73 per year. The payback time is 1.5 years.
- The calculation is based on:
3 hrs light per day, at an energy cost of 0.125 Eur/kWh. The energy savings are EUR 4.64 per year, however, taking into account the lifetime of a bulb it saves an additional EUR 1.09 per year.
- Given the fact that on average a household has 30 light points, the cost savings are significant.

Outdoor Lighting – LED savings potential per region

Saving potential	Global	Europe	North America	Latin America incl. Mexico	Asia Pacific	Middle East and Africa
Euro billion	10	2	3	1	3	1
Mln tonnes of CO ₂	52	8	15	3	18	8
Number of power stations @ 2TWh/year	50	11	14	5	14	6
Car emissions mln cars @ 10k mile/year	20	3	6	1	7	3

Outdoor Lighting – LED can save up to 75%

One third of the world's roads are still lit by technology dating back to the 1960s. When installing new street lighting solutions, this will save up to €10 billion in energy per year. Future legislation within the EU and US will prohibit the installation of inefficient lighting technologies.

- Today's LED lighting solutions, usage monitoring, dimming tools for conditions-based remote control and application of alternative energy sources can save energy by up to **75%**

.....

LED road lighting

A44 The Netherlands



Outdoor Lighting

With green concerns and tight budgets at the forefront of debate, cities are seeking new ways to manage energy while enabling safety. Controls and dimming products like Philips Starsense and CityTouch provide consumption tracking software, dimming and brightening tools for conditions-based remote lighting control, ensuring safety, visibility and a reduction in light pollution.



Office Lighting – LED savings potential per region

Saving potential	Global	Europe	North America	Latin America incl. Mexico	Asia Pacific	Middle East and Africa
Euro billion	22	5	5	2	7	3
Mln tonnes of CO ₂	114	16	28	6	43	21
Number of power stations @ 2TWh/year	109	23	27	12	33	16
Car emissions mln cars @ 10k mile/year	44	6	11	2	17	8

Office Lighting – LED can save up to 70%

Public and commercial buildings represent 60% of global lighting-based electricity use, while 70% of office lighting uses outdated, inefficient lighting systems. Switching from old to new office lighting can save up to 70% in lighting energy costs per year.



.....

Energy savings

- T8 ▶ MASTER LEDtube 50%



Retail Lighting – LED savings potential per region

Saving potential	Global	Europe	North America	Latin America incl. Mexico	Asia Pacific	Middle East and Africa
Euro billion	16	3	5	2	4	1
Mln tonnes of CO ₂	79	10	29	6	27	8

20% - 30% of the energy bill in retail is lighting related. A global annual **saving up to €16 billion in energy costs** can be achieved by switching from old to new lighting in retail. For every application, food or fashion, there is a specific lighting solution, offering best colour quality and energy efficiency

Energy savings

- Halogen ▶ LED 60%

Retail Lighting – LED can save up to 70%

Food/Fast Moving Consumer Goods

- LED Cooler/Freezer lighting for uniform white cool light and 70% energy savings
- LED provide good light quality and efficiency

Fashion

- The StyliD LED combines flexibility, style and energy saving
- AmbiScene and its intelligent light control delivers dynamic, efficient and flexible light



Hospitality Lighting – LED savings potential per region

Saving potential	Global	Europe	North America	Latin America incl. Mexico	Asia Pacific	Middle East and Africa
Euro billion	7	2	2	0	2	1
Mln tonnes of CO ₂	36	6	7	1	15	7

Hospitality is one of the segments with the largest energy saving potential. 42% of energy usage is lighting, of which 70% is inefficient. Approximately one third use energy-inefficient products which use **4-5 times more energy** than energy-efficient alternatives.

Energy savings

- Incandescent ▶ MASTER LED 80%

Hospitality Lighting – LED can save up to 70%

- We **co-innovate** with leading hotel brands and lead the hospitality industry in the shift to LED
- Replacing lighting with energy-efficient LED solutions can save up to €150 per year per hotel room
- System upgrades (luminaires and lighting controls) can bring **70% savings**
- Philips Dynalite control solutions ensure lights are only used when needed, at a level that minimises energy consumption, without impacting on guests' comfort



Healthcare Lighting – LED savings potential per region

Saving potential	Global	Europe	North America	Latin America incl. Mexico	Asia Pacific	Middle East and Africa
Euro billion	5	2	1	0	2	1
Mln tonnes of CO ₂	27	7	5	0	10	5

Lighting can enhance the way we feel, how fast we recover from illness and injury, and how well we work. At the same time it can increase operating efficiency.

Energy savings

- T8 ▶ MASTER LEDtube 50%

Healthcare Lighting – LED can save up to 70%

- Patient-centered care emphasises the effect of individuals' well-being and satisfaction on the quality of their recovery
- In a truly healing environment, created by providing a caring, pleasant ambience throughout the facility, patients feel more comfortable and even recover faster
- Lighting consumes over 20% of all energy costs in a hospital. Adopting energy-efficient lighting is one of the easiest ways to reduce energy use and maintenance costs



Entertainment Lighting – LED can save up to 70%

Lighting should still have the power to create unique experiences and inspire wonder, while saving money and energy. Increasingly, customers in the entertainment industry are having to manage their energy usage. We provide flexible lighting solutions, without high costs to customers or environment.

- Save 63% energy by using iW Blast Powercore instead of regular spotlights
- The VARI*LITE VLX Wash luminaire combines LED technology with the visual performance of traditional luminaires



Industry Lighting – LED can save up to 70%

Upgrading industrial lighting offers enormous savings potential: especially for factories using old lighting technologies and/or with lights on 24/7. A factory can save up to 70% by switching to energy saving alternatives, combining lighting, luminaires and controls. The investment will pay for itself in just 2-5 years' time.



Barriers to Switch

Lack of awareness – people simply don't know the benefits of good quality LED lighting

- Lighting is of low interest
- People don't see the electricity costs associated with lighting
- They are not aware of the new, energy-efficient lighting technologies
- Often decision makers are not lighting experts

Investment costs

- 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

Potential business enablers; overcoming the investment hurdle

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

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

Triple-Win

Energy-efficient LED lighting technology offers a unique **Triple-Win:**

- **Users / taxpayers** save costs and obtain better light quality
- **The environment** benefits from lower energy/CO₂ emissions
- **Business / country competitiveness** is strengthened

Legislation plays a crucial role in realising lighting's savings potential.

Energy-efficient lighting is an opportunity for **all countries** and will equally benefit their populations as well as their future competitiveness.

Notes on sources and calculations

- Global average 40% energy saving potential. Regional differences exist based on installed lighting base, regional lighting preferences and present switching status
- Advanced technologies have faster penetration with energy-efficient products, others are slower
- Market figures have various sources including: ELC, NEMA, Cali, CSIL, trade statistics, Philips Lighting central Market Intelligence
- The energy saving figures based on average electricity price of €0.10/kWh. Source a.o. Eurostat
- CO₂ calculations based on regional features, ranging between 0.3-0.8kg CO₂/kWh. Source IEA
- All figures are underpinned by third party sources for calculations

For information, please contact Lighting Sustainability lighting.sustainability@philips.com



©2012 Koninklijke Philips Electronics N.V.

All rights reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent- or other industrial or intellectual property rights.

Date of release: June 2012
Printed in the Netherlands