

PHILIPS

The energy saving potential of existing energy efficient lighting

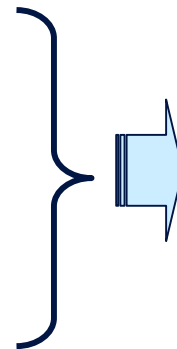
Harry Verhaar – Sr. Director - Energy & Climate Change

Avila Energy Congress
Avila 26 April 2007

Energy & Climate Challenges

Need for Energy Efficiency is growing

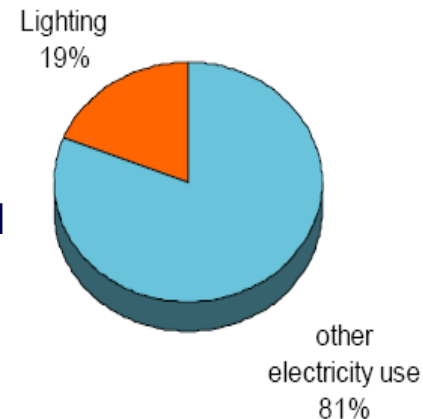
- Energy prices
- Climate change / Kyoto
- Supply security
- Economic growth



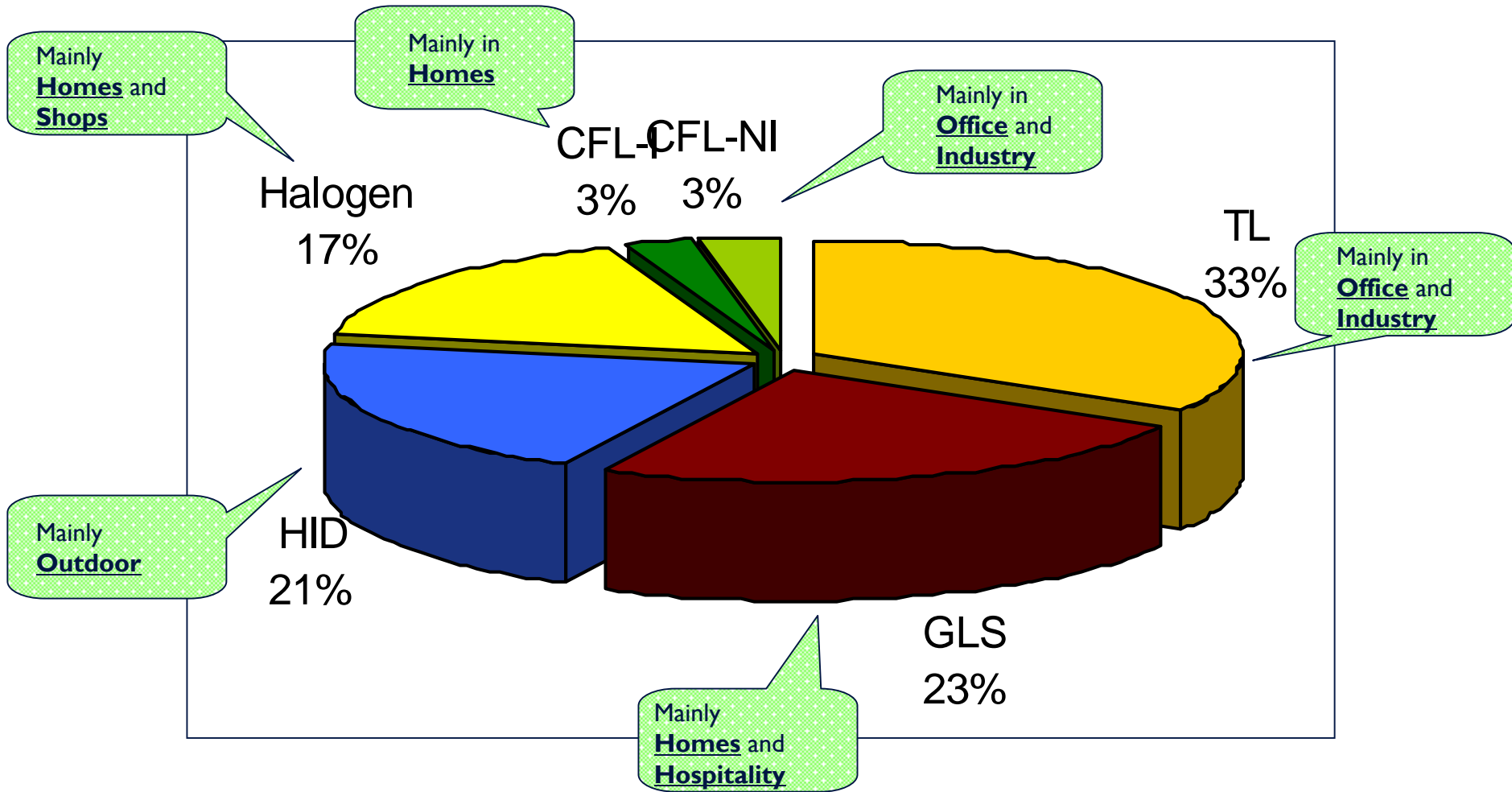
Energy Efficient Lighting



Lighting makes up 19% of global electricity consumption:


















CO₂ emission from burning fossil fuels for Power Generation used by *Lighting* (EU27)

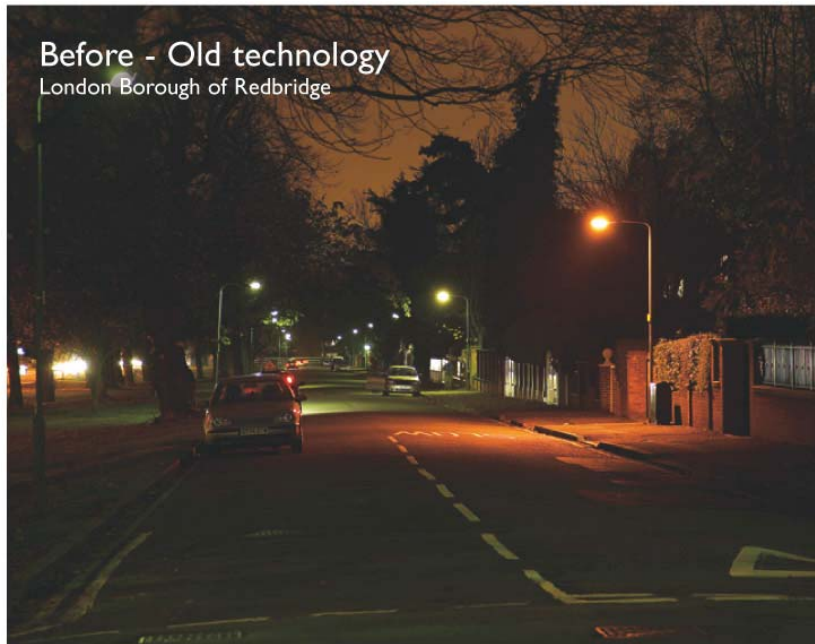


Examples of energy saving lighting solutions



Area of lighting	Energy saving	CO2 savings per lamp per year
Road lighting	HPL  57%   CosmoPolis	109 kg CO ₂
Shop Lighting	Halo  80%   CDM	115 kg CO ₂
Office & Industrial Lighting	TL8  61%   TL5	77 kg CO ₂
Home Lighting	GLS  80%   CFLi	34 kg CO ₂
LEDs	GLS  82%   LED	34 kg CO ₂

New technology offers huge energy savings and also means more safety on roads



EU Road Lighting - potential savings 3.5 Million tons of CO₂*

* excluding dimming / lighting controls

EU Street Lighting



- 56 Mio street-lighting light points (source: VITO)
- One third still using 1930`s technology
 - High-Pressure Mercury Lamps (HPL)
- Alternatives available:
 - High Pressure Sodium
 - Ceramic Metal Halide (Cosmopolis)

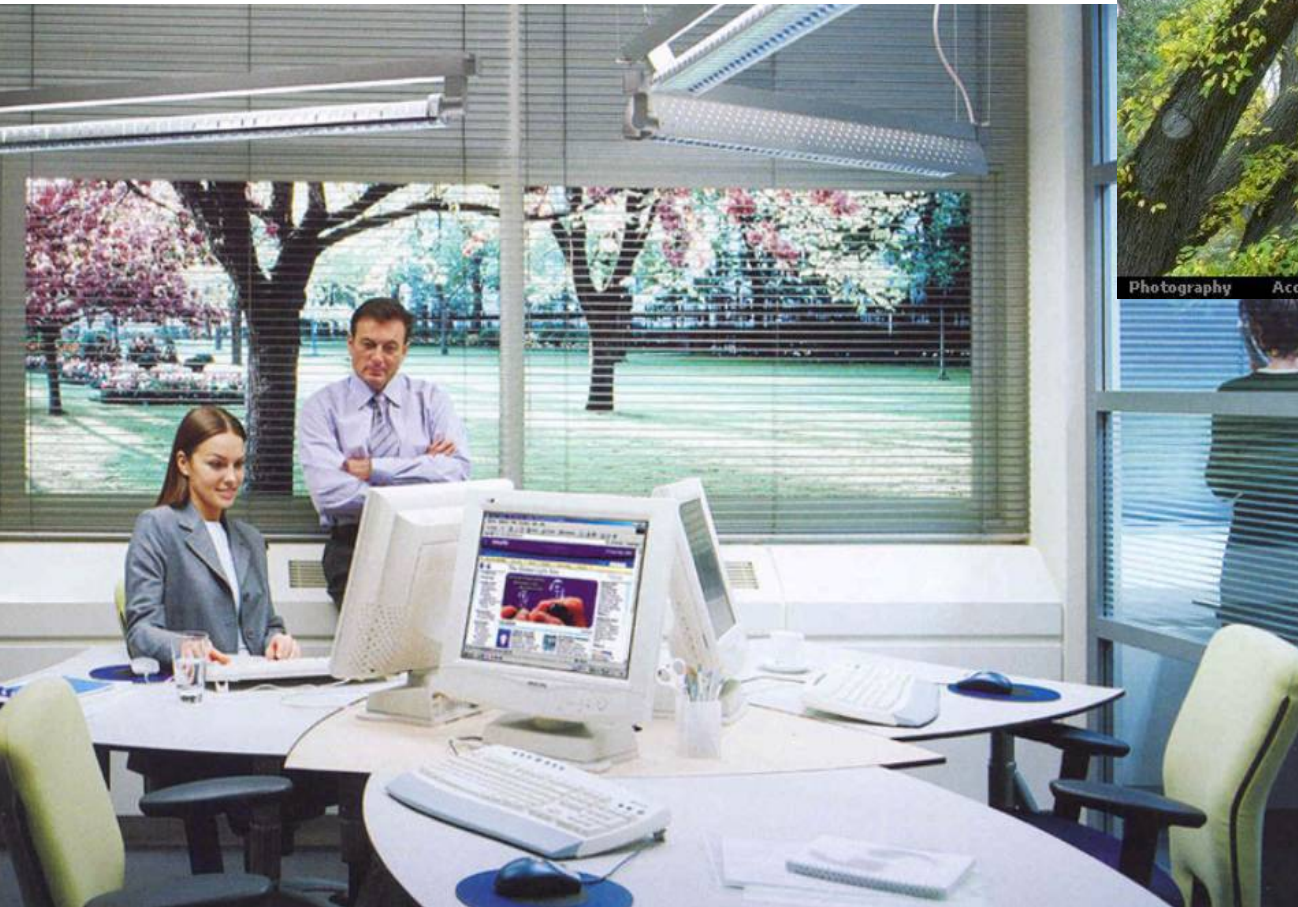


50 lm/W



100 lm/W

New research on EU Office Lighting



Less than only 25%
of Europe's
office lighting is
energy efficient

And complies with
quality standards for
office workers

(EN 12464-1)

EU Office & Industry Lighting



Old Technology



- Old fluorescent lamps
- Passive Analogue drivers

New technology



- High efficiency TL5 fluorescent lamps
- Active electronic drivers
- Lighting control systems

EU27: 75% old 1940`s technology; only 1% using lighting controls
1 Bio 'TL' light-points

Energy saving opportunities in home lighting

100W incandescent light bulb



Electricity costs per year:
Up to € 15
Average lifetime: 1 year

100W light bulb 1000 hours
per year 0.15 p/kwh

20W Energy saving CFL light bulb



Electricity costs per year:
€ 3
Average lifetime: 6 year

Up to 12 euro saving per year
or € 72,-during 6 years

Energy Saving Options for Domestic Lighting



1. Compact Fluorescent Lamps

- 80% Energy Savings
- Major improvements last few years (size; light; cost; ..)
- Need to balance demand and global industry capacity

2. Energy Saving Halogen

- Up to 50% Energy Savings; high light quality
- Replacement range in launch phase

3. Solid State Lighting (LED`s)

- Currently for decorative replacements
- Today limited but fast improving light output

EU Domestic Lighting

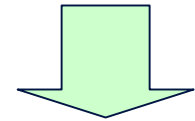
EU27

- Currently approx 2.1 billion incandescent light bulbs are sold in EU 27 each year
- Installed base 3.6 billion
- Household penetration CFL lamps in EU approx 15%
- Market adoption CFL slow – although increasing recently

Global

- Global annual incandescent sales volume around 12.5 billion (10 times CFLi)
- Installed incandescent base approximately 15 billion

Two thirds of
all lamps
volume



within 10 years
all (new & available)
alternatives
can replace
installed GLS base

Projected Energy Savings through EE Lighting

Segment	Product	Realistic Savings	Ambitious Savings
Streetlighting	HID	25%	35%
Office & Industry	TL	20%	35%
Homes	GLS	50%	70%
Lighting total		20%	40%

Realistic:

1. Streets : Phase-out HPL/ML
2. O&I : 1/3 EM; 2/3 HF; 10% controls
3. Homes : 50/20/30 CFL/ESH/GLS

Ambitious:

1. Streets : id. + 40% controls
2. O&I : 100% HF; 30% controls
3. Homes : 70/10/10/10 CFL/ESH/LED/GLS

Country examples

Realistic Scenario (10 yrs; 20% savings)

Country	Electricity (TWh)	CO ₂ (Mton)	Electricity (Bio €)
Germany	17.2	8.8	2.3
UK	14.6	6.1	1.3
France	13.7	0.6	1.2
Spain	11.4	3.6	1.0
Portugal	2.6	1.0	0.3
Greece	2.6	1.9	0.2

National Energy Efficiency Action Plans

- Consolidated savings for Street-lighting; Offices & Domestic
- Timeframe:
 1. Street-lighting & Office (tbd in NEEAP` s)
 2. Domestic (2016)

Note: 1. CO2 conversion factor
2. Differences in electricity prices

Europe (EU27)

Savings potential of existing lighting technology



Savings	Realistic	Ambitious
Electricity (Bio €)	12	24
CO ₂ (Mtons)	43	86
Oil (Mio Barrels eq.)	150	300
Power plants	50	100



Overcoming Barriers



Current rate of
switch over too slow



Acceleration
of renovation



1. Awareness Campaigns (public / private)
2. Policy Measures / deployment (IM`s EUP; NEEAP`s)
3. Partnerships (public / private / NGO`s / utilities)

Supportive Policy Measures

Suggestions to accelerate market uptake of more efficient products

1. Green Procurement
2. Financial incentives
3. Disallowing old inefficient products
4. Environmental performance targets

NEEAP`s

Relevant for New Installations & Renovation

New Installations

- Minimum Energy Efficiency Targets (Products; Applications)
- Energy Efficiency Label x differentiated VAT
- Phase-out schemes old lighting technology

Renovation

- Street-Lighting in Municipalities
- Lighting in Government Offices; Schools; Hospitals; Large Companies
- Utility investment in EE per household (pay-back in electricity bill)

+ improved Market Surveillance

Summary



New lighting technology **exists** now, but current adoption rate needs **acceleration** (through renovation programs)

This technology offers a unique **triple win**

1. **Users/tax payers** save costs & have better light quality
2. **The environment** benefits from lower energy/CO₂ emissions
3. **European competitiveness** is strengthened

NEEAPS play a crucial role in realizing lighting`s savings potential, with **role model** behaviour for governments and private sector

