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sense and simplicity

The energy saving potential of existing energy efficient lighting

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The energy saving potential of existing energy efficient lighting

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Citi's Climatic Consequences Conference

London, June 5, 2007

Forward Looking Statements

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Presentation overview

- Opportunity – background facts
- Lighting Solutions, facts and figures
  - General Lighting
  - Street Lighting
  - Office Lighting
  - Home Lighting
- Overcoming barriers
- Supportive policy measures/legislation
- Summary

What is the opportunity – background facts

- Lighting consumes 14% of all electricity within the European Union
- Lighting consumes 19% of all electricity in the world
  (source IEA)

Key issues

- **Rising energy prices**
- **Global climate change**
- **Security of energy supply**
- **Economic growth**

Value proposition = Energy efficient lighting

What is the opportunity – background facts (cont.)

There has been a revolution in lighting technology during the past 10-15 years. Switching the older lighting to the **latest technology** will bring **huge savings** in energy costs and CO2 emissions.

Approximately **2/3** of all lighting currently installed in the European Union is based on **older, less energy efficient technology** (developed before 1970)

Our **current changeover rate** to new lighting technologies is simply **too slow**: e.g. for street lighting the changeover rate is 3% per year, for office lighting 7%.

Energy efficient lighting solutions

For each market an energy efficient lighting solution exists today
75% of all lighting outside the home in the professional sector

Area of lighting		Energy savings		CO_2 savings per lamp per year
Street lighting	HPL 	57% →	 CosmoPolis	109 kg CO_2
Retail lighting	Halo 	80% →	 CDM	115 kg CO_2
Office & Industrial lighting	T8 	61% →	 TL5	77 kg CO_2
Home lighting	GLS * 	80% →	 CFLi *	34 kg CO_2
LEDs *	GLS 	82% →	 LED	34 kg CO_2

* GLS = incandescent lamp, CFLi= energy saving lamp

Facts and figures – general lighting (global)

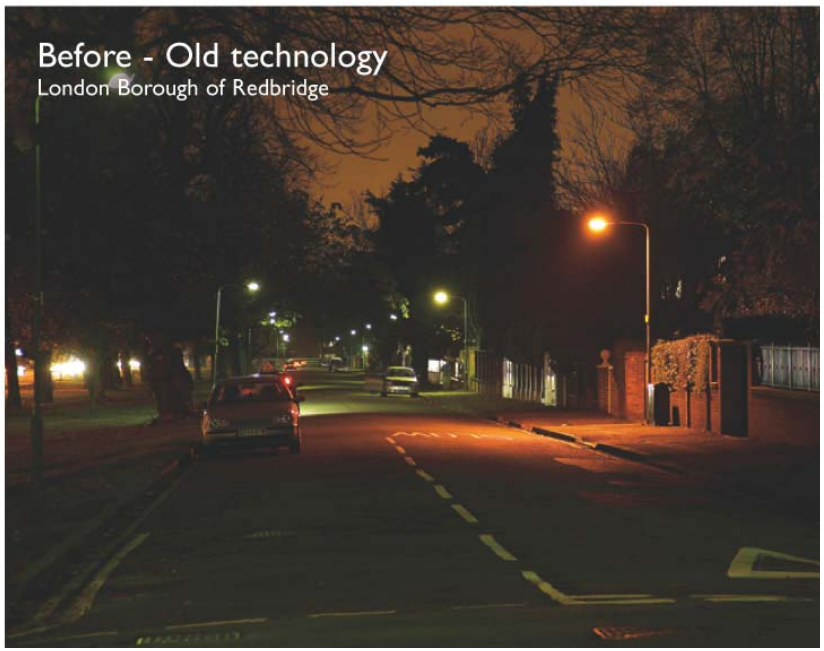
A realistic energy saving of up to 40% on all the lighting currently installed globally would save:

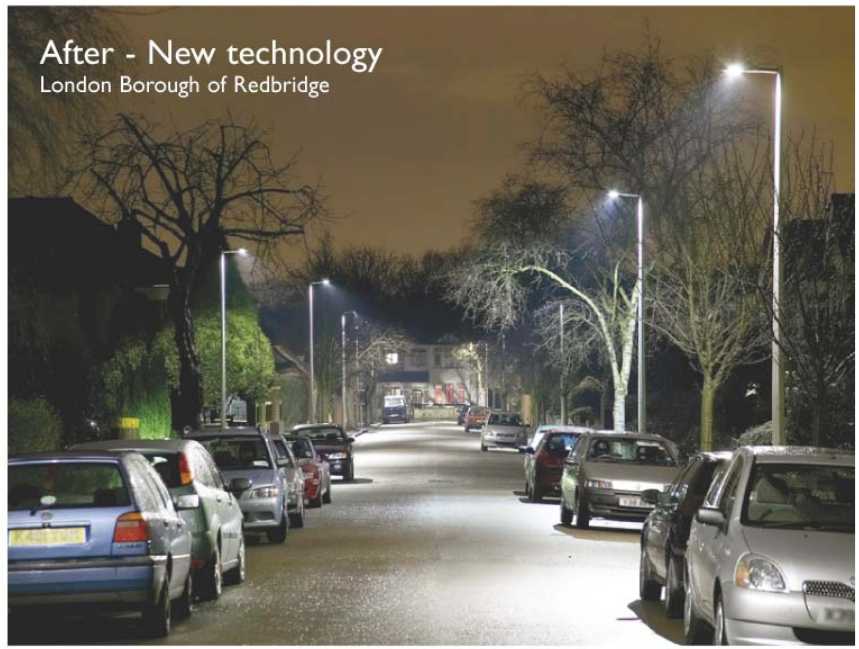
EUR 106 billion in energy costs
This equates to:

- 590 million tonnes of CO2
- 1560 million barrels of oil per year
- Annual output of 530 medium sized power stations @ 2TWh/yr

Examples –

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





EU Road Lighting - potential savings 3.5 Million tons of CO_2

Facts and figures – street lighting (EU) (cont.)

- EU City Councils would save EUR 1.7 billion (based on 2006 energy prices) in energy costs per year by switching from mercury lamps to the latest road lighting technology such as Ceramic Metal Halide lamps (non-retrofit).

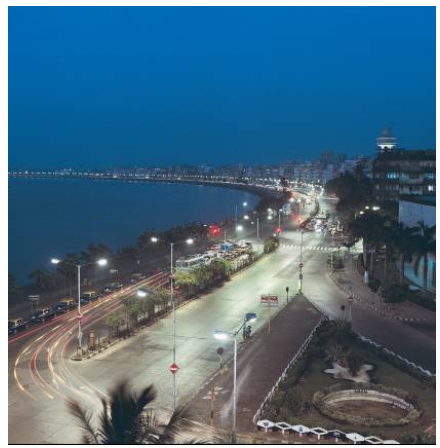
- **This equates to:**

3.5 million tonnes of CO_2

14 million barrels of oil per year

Annual output of 5 power stations @ 2TWh/yr

(Figures based on 20% average saving)



Examples - 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)

Examples - EU lighting in buildings

Old Technology

- Old fluorescent lamps
- Passive Analogue drivers

New technology

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

Energy savings of up to 75% are possible with new lighting technology which also provides better quality light

Facts and figures – lighting in buildings (EU) (cont.)

EU buildings could save 5 billion euros per year in running costs
This equates to:

- 8 million tonnes of CO2
- Consumption of 29 million barrels of oil per year
- Annual output of 10 power stations @ 2TWh/yr

(Figures based on 20% average saving)

Major savings also in:

retail lighting
industrial lighting
floodlighting & sports lighting
security lighting
special lighting

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: 8 year

Up to 12 euro saving per year or € 96, -during 8 years

Energy saving options for home 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 home 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 (8 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

Facts and figures – home lighting (EU) (cont.)

By switching from incandescent light bulbs to other energy saving bulbs And achieve an average saving of 50% the EU could save:

5-8 Billion Euros per year – This equates to

- 20 million tonnes of CO2
- Consumption of 74 million barrels of oil per year
- Annual output of 25 power stations @ 2TWh/yr

Electricity prices higher for home lighting than commercial rates

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. Discouraging inefficient lighting products
4. Environmental performance targets

Upcoming legislation (EU)

1. EUP - Energy Using Products Directive being developed by EU
   Will effect Road lighting, Office lighting, Home lighting

2. ESD – Energy Services Directive
   The mandatory development of National Energy Efficiency Action Plans (NEEAPS) All EU member states have to submit plan by June 30 2007

3. Update Buildings Directive being planned (EPBD) 2009

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/CO_2 emissions
3. **European competitiveness** is strengthened

National energy action plans can play a crucial role in realizing lighting`s savings potential, with **role model** behavior for governments and private sector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