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Energy efficient lighting

A summary of "Green Switch" facts - February 2007

PHILIPS

Contents

1. What is the issue - background facts.....3
2. Facts and figures - General lighting (global).....7
3. Facts and figures - Street lighting (EU).....9
4. Facts and figures - Office lighting (EU).....13
5. Facts and figures - Home lighting (EU).....15
6. Facts and figures - Industrial lighting (EU).....18
7. Barriers to Green Switch.....19
8. Philips position on solutions.....20
9. New legislation and Philips position..... 22
10. Regional facts and figures.....24
11. Notes on sources and calculations.....29

1. What is the issue - background facts

- Lighting consumes 14% of all electricity within the European Union (source IEA)
- 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 issue - 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 CO_2 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 rates to new lighting technologies (green switch) is simply too slow: e.g. for street lighting the changeover rate is 3% per year, for office lighting 7%. Therefore action is required to help speed up this rate of change.

Energy efficient solutions

For each customer segment an energy efficient lighting solution exists already today

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

2. Facts and figures - General lighting (global)

A realistic energy saving of 20% on all the lighting currently installed globally would save*:

- EUR 53 billion in energy costs
- This equates to:
  - 296 million tonnes of CO_2
  - 779 million barrels of oil per year
  - Annual output of 265 medium sized power stations @ 2TWh/yr

*with current technology 30 to 40% is possible

3. Facts and figures - Street lighting (EU)

Approximately 1/3 of Europe's roads and motorways are still lit using cheap, inefficient 1960's technology: Mercury vapour lamps.

Some countries (e.g. Belgium, Netherlands, Luxembourg, UK) use far less mercury vapour lamps than others (Germany, Italy, Spain). The 35 million outdated mercury vapour lamps still in use consume twice as much electricity as necessary and create a cost burden both for local authorities and tax payers, while producing high CO_2 emissions.

Current change over rates are running at 3% per year. This means that it will take more than 30 years for the full financial and environmental benefits to be realized.

This is simply too slow.

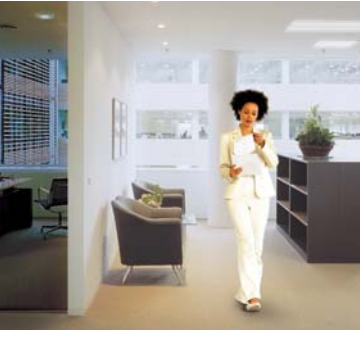
Before - Old technology
London Borough of Redbridge

After - New technology
London Borough of Redbridge

Facts and figures - Street lighting (EU) (cont.)

- 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



4. Facts and figures - Office lighting (EU)

New research by Philips has revealed that more than 75% of Europe's Office lighting is based on outdated and energy inefficient lighting systems, which do not comply with the EU Quality standards for Offices.

- Massive energy cost savings of more than EUR 2 billion per year are now available to both public authorities and private business owners across Europe who upgrade their lighting to more modern technology.

Today only 1% of office lighting uses lighting controls (presence detection and daylight control). An additional EUR 3 Billion in energy cost savings can be achieved.

Facts and figures - Office lighting (EU) (cont.)

- This equates to:
  - 8 million tonnes of CO_2
  - Consumption of 29 million barrels of oil per year
  - Annual output of 10 power stations @ 2TWh/yr

- The latest fluorescent lamps use extremely low levels of hazardous substances

- The latest lamp and gear technology is up to 40% smaller and lighter than its predecessors
  - This means less raw materials are needed to create new fittings or luminaires
  - This also means less transport is needed to move products, saving CO_2 emissions

5. Fact and figures - Home lighting (EU)

Figures show that around 2 billion incandescent lamps were sold within the EU in 2005. Of these lamps almost 3/4 are used in the home, but a massive 550 million are still sold to commercial and professional applications (including 184 million to offices, 168 million to hospitality sector, 66 million outdoors).

By simply switching these incandescent lamps over to other energy saving lighting technologies (and achieving a realistic average saving of 50%) the EU could save:

- EUR 5-8 billion per year in energy cost savings
- This equates to:
  - 20 million tonnes of CO_2
  - Consumption of 74 million barrels of oil per year
  - Annual output of 25 power stations @ 2TWh/yr

In December 2006, Philips called for a joint action to replace all incandescent lamps within 10 years.

6. Facts and figures - Industrial lighting (EU)

Figures show that approx 75% of all the lighting used in the EU industry sector are based on older less energy efficient lighting technologies.

- Energy cost savings of EUR 650 million per year could realistically be achieved by upgrading today to new energy saving lighting technologies.

- This equates to:

2.7 million tonnes of CO_2

Consumption of 9.5 million barrels of oil per year

Annual output of 3 power stations @ 2TWh/yr

7. Barriers to Green Switch

Lack of awareness - people simply don't know the opportunities

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

Initial investment costs

- Lack of awareness that although energy efficient lighting technologies cost a little more initially, they have fast paybacks and save a large amount of energy/money during their lifetime.

8. Philips position on solutions

1. Green procurement

- Encourage adoption of more energy efficient lighting (e.g. in buildings)
- Set mandatory energy performance standards
- Aim for the lowest cost over lifetime
- Implement renovation budgeting

2. Financing schemes

- Overcome initial and renovation investment hurdle/speed up conversion
- Support leasing schemes (Payback, Energy Service Companies)
- Support public and private funding programmes (development/green banks; Private Finance Initiatives etc.)

3. Discouraging old inefficient technology

- Support phase out schemes, a.o. for high pressure mercury, standard fluorescent and incandescent
- Enhance adoption speed of more efficient lighting technologies
- Increase awareness: communication
- Implement lower VAT on efficient products, higher VAT on products with old technology

4. Environmental (performance) targets

- Set targets for CO_2 per m^2 office /km road
- Implement regulation: standards benchmarks (examples)
- Realize benchmark projects in large cities and government buildings
- Implement visible metering of electricity consumption

9. New legislation and Philips' position

The EUP Directive (Energy Using Products, also known as the Ecodesign Directive) is currently being defined for Street lighting and Office lighting. This will effect new installations.

We are seeking to create legislation around minimum energy efficiency criteria for lighting systems as part of CE marking (Lamps, Gear and Luminaires) and energy efficiency performance targets in norms and lighting schemes (EN12464-1 for Indoor and EN13201 for Street lighting).

The ESD (Energy Services Directive) is looking to enforce performance criteria on the suppliers of energy. Currently each country must produce an annual energy efficiency plan. Lighting should be a part of this.

This should offer opportunities to address the renovation of the large installed park of older lighting in existing buildings. This will have the lowest cost impact.

EPBD (Energy Performance in Buildings Directive) sets minimum energy criteria for buildings larger than 1000m^2, effective January 1, 2006. This should effect both renovation and new business. Lighting is one part of a bigger picture and has to compete with other building services. A new energy action plan promises an update for smaller buildings by 2009.

10. Facts and figures - Global lighting

A realistic energy saving of 20% on all the lighting currently installed globally would save:

- EUR 53 billion in energy costs per year
  (20% savings @ 0.10 Euro kw/h)

- This equates to:
  - 296 million tonnes of CO_2
  - 779 million barrels of oil per year
  - Annual output of 265 medium sized power stations @ 2TWh/yr

Facts and figures - Europe

A realistic energy saving of 20% on all the lighting currently installed in Europe would save:

- EUR 14 billion in energy costs per year
  (20% saving @ 0.10 Euro kw/h)

- This equates to:
  - 59 million tonnes of CO_2 emissions per year
  - 196 million barrels of oil per year
  - Annual output of more than 67 power plants @ 2 TWh/yr

Facts and figures - Asia Pacific Region (APR)

A realistic energy saving of 20% on all the lighting currently installed in APR would save:

- EUR 17 billion in energy costs per year
  (20% saving @ 0.10 Euro kw/h)

- This equates to:
  - 121 million tonnes of CO_2 emissions per year
  - 247 million barrels of oil per year
  - Annual output of more than 84 power plants @ 2TWh/yr

Facts and figures - USA and Canada

A realistic energy saving of 20% on all the lighting currently installed in the USA and Canada would save:

- EUR 17 billion in energy costs per year
  (20% saving @ 0.10 Euro kw/h)

- This equates to:
  - 90 million tonnes of CO_2 emissions per year
  - 244 million barrels of oil per year
  - Annual output of more than 83 power plants @ 2TWh/yr

Facts and figures - Latin America (including Mexico)

A realistic energy saving of 20% on all the lighting currently installed in Latin America (including Mexico) would save:

- EUR 4 billion in energy costs per year
  (20% saving @ 0.10 Euro kw/h)

- This equates to:


9 million tonnes of CO_2 emissions per year


51 million barrels of oil per year


Annual output of more than 18 power plants @ 2TWh/yr

11. Notes on sources and calculations

- Market size figures comes from Philips Lighting Central Market Intelligence
- Figures have been deliberately understated in keeping with the principle that it is better to err on the side of caution
- The figures quoted are based on an average electricity price of 0.10 Euro p/kwh
- Global figures are also calculated using 0.10 Euro p/kwh
- Calculations for CO_2 are based on regional characteristics and therefore range between 0.3 and 0.8 kg CO_2 p/kWh
- All figures underpinned by third party sources for calculations

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