

MAKE THE SWITCH

THE ELC ROAD MAP FOR DEPLOYING ENERGY
EFFICIENT LIGHTING TECHNOLOGY ACROSS EUROPE



EUROPEAN

LAMP

COMPANIES

FEDERATION

CONTENTS

3 Introduction

4 The Case for Energy Efficient Lighting

5 The Barriers to Change

6 Our Strategy

6 Restricting the Supply of Inefficient Lamps through setting minimum limits

- 7 Public street lamps
- 7 Office lamps
- 8 Domestic lamps

9 Stimulating the Demand for Energy Efficient Lamps

- 9 Building and improving consumer awareness
- 10 Greening Europe's buildings
- 10 Encouraging Europe's public purchasers to lead by example
- 11 Closing the investment gap

12 Conclusions

ELC Federation - Created in 1985, the European Lamp Companies Federation (ELC) (Aura, BLV, GE, Narva, OSRAM, Philips, Havells Sylvania) is both the forum and the voice of the lamp industry in Europe. It represents the leading European lamp manufacturers, which collectively directly employ 50,000 people, and account for 95 percent of total European production, with an annual turnover in Europe of €6 billion. From the outset, ELC objectives have been to promote efficient lighting practice for a sustainable environment and the advancement of human comfort, health and safety.

www.elcfed.org

INTRODUCTION

Improving Europe's "energy efficiency" is crucial for Europe to address the issue of climate change. Europe can lower its carbon emissions, save consumers' money, increase companies' competitiveness, and quite literally help to ensure that the lights don't go out in an era of increasing energy insecurity.

It is precisely because improving energy efficiency is key to helping in all these areas that it is now central to the EU's bold, long-term strategy for reducing EU greenhouse gas emissions by 20% by 2020 (30% if major nations such as the United States, Russia, China and India follow suit)¹.

Heads of State and Government have committed to saving 20% of Europe's energy consumption by 2020,² and to achieve this, a wide range of measures to encourage the use of more efficient technologies, such as energy-efficient lighting technology, will need to be deployed.

The EU's Climate and Energy Goals - Not Just Hot Air!

An "energy saver" is now one of the most iconic images of efforts to move to a lower carbon lifestyle. In fact, lighting is often cited as low hanging fruit in the effort to slow global warming. At the EU summit in March 2007, the European Commission was asked "to rapidly submit proposals to enable increased energy efficiency requirements on office and street lighting to be adopted by 2008, and on incandescent lamps and other forms of lighting in private households by 2009".

Lighting is responsible for 14% of the EU's electricity consumption and requires as much electricity as is produced by all gas-fired generation. New energy efficient lighting technology can reduce energy consumption by as much as 80% and it can last up to 15 times longer than conventional equivalents.

Our Efforts to Help Europe 'Make the Switch'

The European Lamp Companies Federation (ELC) and its member companies have taken the lead in encouraging an ambitious and wide-ranging approach to the challenge of 'Making the Switch' for several years.

We are working across Europe in Brussels and in the individual Member States (through our Roll Our Member States Programme – ROMS³) both alone and in partnership (our industry



Figure 1. José Manuel Barroso, President of the European Commission and Andris Piebalgs, Member of the European Commission in charge of Energy at a press conference for the presentation of the Green Paper on Energy. March 2006

1 http://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/ec/93135.pdf

2 Action Plan for Energy Efficiency: Realising the Potential - COM(2006)545 final

3 For more information about ROMS and to contact a ROMS working group near you see: <http://roms.elcfed.org>

partners CELMA, AIE, and EUEW⁴, our customers, NGOs, public authorities and retailers), to identify the barriers to change and assist end users to overcome these barriers.

This includes overcoming consumer reluctance to invest in potentially higher priced lamps even though the total cost of energy efficient lamps throughout their lifecycle is radically lower due to their energy consumption. Also there is a need to help governments ensure that low cost, low quality products do not enter the European market.

Our strategy is simple, just like classic economic theory; we focus on supply and demand;

- We are working with regulators to develop legislative tools under the EU's Eco-Design of Energy-using Products Directive (EUP)⁵ that set mandatory efficiency standards for lighting products. These standards will lead to the phase-out (or a **restriction of supply**) of the least efficient products from the European market over the coming years.
- We also realise that policies and measures such as awareness campaigns, the use of building codes, green procurement and the use of appropriate fiscal instruments, can effectively **encourage demand** for the most efficient products. This wide range of possibilities is given further focus by the obligations on Member States under the EU's End-Use Energy Services Directive⁶ and their own National Energy Efficiency Action Plans (NEEAPs) and are further encouraged by the Energy Performance of Buildings Directive (EPBD)⁷. We are working in these areas, among others.

This paper is our roadmap for helping Europe to 'Make the Switch' to energy efficient lighting technology. It outlines our vision for how Europe can encourage the uptake of more energy efficient lighting technologies in more detail.

We hope that you will find it a useful introduction to our activities in this area, and we hope that it will encourage you to travel with us on our road to help capture the potential of energy efficient lighting in Europe.

THE CASE FOR ENERGY EFFICIENT LIGHTING

Energy efficient lighting is one of the quickest, most practical and most cost-effective ways for Europe to save energy.

According to our industry estimates, we could save Europe approximately 42.5 Million tonnes of CO₂ or 17.5 billion euros in running costs through energy efficient lighting each year⁸.

The environmental and financial benefits of the energy efficient alternatives speak for themselves; however, once you get past the front door of our European citizens, the situation can be quite different. Anecdotal evidence suggests that many energy saving lamps, particularly those distributed at no cost, are never installed. Furthermore, a householder who buys and uses one CFL does not automatically repeat that purchase for every light fitting in their home.

4 www.celma.org; www.aie-elec.org; www.euew.org

5 Directive 2005/32/EC

6 Directive 2006/32/EC

7 Directive 2002/91/EC

8 Figures are based on the latest (conservative) industry estimates for the a total switch to energy efficient street, office, industry and domestic lighting in the EU (27).

- A striking amount of Europeans are still using inefficient products to light their homes
- Over a third of Europe's roads and motorways are still being lit using old 1960's technology, and around
- 75% of Europe's offices are still using inefficient fluorescent lighting. Why is this still the case?

THE BARRIERS TO CHANGE

Behavioural change is difficult to influence; people have complex and unpredictable tastes and don't always react as you'd expect. Behavioural attitudes to lighting are no exception to this rule. Despite the significant reductions in price that have already occurred and the availability of new high performing energy efficient lamps, particularly over the past 2-3 years, all the behavioural evidence available points to the differential in the initial purchase price being the main factor which influences purchasers⁹. This is true of individual consumers, public administrations and private companies despite the clear evidence that total cost of ownership of an energy efficient lamp is many times lower than its traditional equivalent (up to 15 times longer depending on the lamp).

- Changing the habits of individual consumers is perhaps one of our largest barriers. Consumers have been using incandescent lamps for over 100 years making it difficult to change their purchasing habits. This is also coupled with a poor understanding of the functional and esthetical developments in new energy efficient lighting technologies as well as the limitation given by existing installed luminaires.
- Public purchasers can also be a challenge; those responsible for choosing and maintaining public lighting are often not responsible for purchasing decisions. The high initial or renovation investment is often a deterrent to public authorities with limited budgets, **even if the environmental and economic benefits are understood**.
- Finally many private sector organisations in Europe (and in particular SMEs) do not directly pay for the buildings' energy use. They do not feel responsible for switching to energy efficient lighting, even if it makes financial sense.

The lighting market is also one of the few markets where although new efficient technology exists, old and/or inefficient technology is still readily available on the market. This is particularly challenging as many of the 'energy efficient' lighting products on the European market are not only non-compliant with basic safety, functionality and CE performance standards; they also have very low lifetimes. Consumers regularly feel 'let down' by low quality products as a result of poor market surveillance.

How are we responding to these challenges? We haven't found a secret formula; again our strategy is based on the classic economic theory of supply and demand.

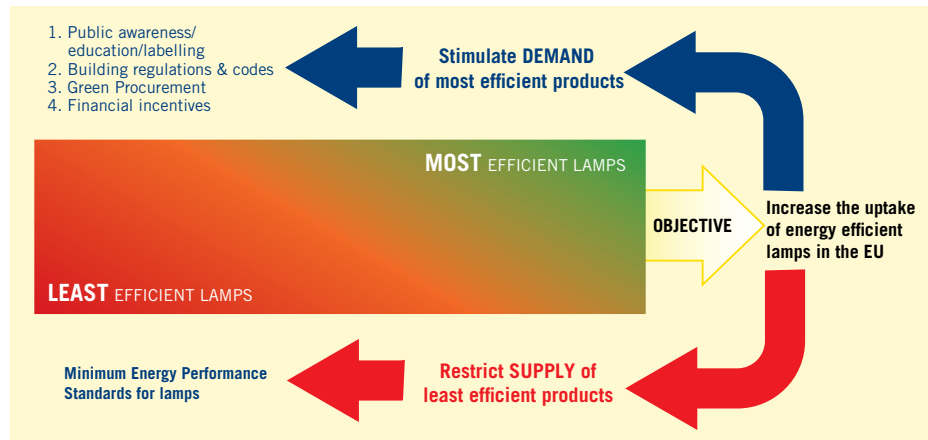
9 According to the UK Energy Saving Trust – www.est.org

OUR STRATEGY

Our aim is quite simple; we want to ensure that Europe supports and encourages all end users (professional and domestic) to make the switch to energy efficient lighting technology through:

- Restricting SUPPLY of less energy efficient products through legislative initiatives.
- Stimulating DEMAND for energy efficient products at all levels (European, national, regional and local).

Figure 2. – The ELC ‘Make the Switch’ Strategy



Restricting the Supply of Inefficient Lamps through Minimum Limits

We are working with European and national regulators to develop lighting specific ‘implementing measures’ under the EU’s Eco-Design of Energy-using Products Directive (EUP)¹⁰. By as early as 2009, these pre-market measures will ensure that all new public street, office and domestic lighting products (lamps, ballasts and luminaires) that enter onto the EU market comply with strict energy efficiency and performance criteria. The EUP Directive is a valuable tool to enable this process and it is important that the forthcoming Implementing Measures proceed quickly and effectively.

With this in mind, we are working to ensure that legislators set strict minimum criteria based on luminous efficacy for public street, office and domestic lamps¹¹. Luminous efficacy (measured in lumens per watt or lm/W) is light output in relation to power input and is the key measure of energy efficiency for lamps i.e. the higher the efficacy value the more energy-efficient the lamp. This calculation varies of course between technologies and wattages.

We are urging the European Commission and Member States to ensure that all lamps that

¹⁰ Directive 2005/32/EC

¹¹ Our industry partners, CELMA are working jointly with us to develop criteria for ballasts and luminaires.

do not satisfy the limits set out in this legislation should not be granted the CE mark and therefore should not be allowed to enter the European market. This would enable consumers to easily recognise compliant products.

For this approach to be fully effective, we believe that Europe’s market surveillance systems need to be strengthened to ensure that this ambitious legislation does not result in market distortion and incentives to free-ride the legal requirements. Huge numbers of low quality products enter freely into the European marketplace each year from unscrupulous manufacturers who exploit poor market surveillance systems. For lamps, this problem is particularly dangerous. Many of the ‘energy efficient’ lamps on the European market are not only non-compliant with basic safety, functionality and CE performance standards but they also have very low life times and are threatening to undermine consumer confidence in energy efficient lighting technology as a whole. We will be working with national governments and market surveillance authorities to make sure effective and timely market surveillance systems are implemented in Europe.

Public street lamps

Public street lamps will be the first area subject to legislation under EUP. For these lamps we are working to encourage legislators to adopt the following two phase approach:

1. Phase 1 would set the binding minimum energy efficiency requirements for all HID lamp types used for general lighting purposes within 2 years of the entry into force of the Public Street Lighting Implementing Measure.
2. Phase 2 would ensure continual improvement and innovation by raising minimum energy efficiency requirements for high pressure sodium (HPS) and metal halide lamps (MH) within 5 years of the entry into force of the legislation.

For detailed information on the energy efficiency requirements for HID, HPS and MH lamps see: www.elcfed.org (Eco Design)

To ensure continued quality and cost effectiveness for Europe’s consumers, all lamps placed on the EU market should also have a minimum-rated lifetime and comply with installation requirements based on compliance criteria from the European road lighting standards series: EN13201-1, -2, -3 and -4.

Office lamps

Our proposal for office lamps would ensure that all linear and compact (non-integrated) fluorescent lamps intended for general illumination comply with minimum efficacy criteria within 3 years of the entry into force of the Office Lighting Implementing Measure.

For detailed information on the energy efficiency requirements for HID, HPS and MH lamps see: www.elcfed.org (Eco Design)

To ensure continued quality and cost effectiveness for Europe’s consumers, all lamps intended for general illumination placed on the EU market should also have a minimum-rated lifetime and comply with installation requirements based on compliance criteria according to EN 12464-1 for office lighting.

Domestic lamps

The ELCs domestic lighting proposal concerns all non-directional light sources with Edison and Bayonet caps. It consists of 5 phases, starting with highest wattage lamps and gradually covering lower wattages.

For each phase, there are minimum efficiency specifications based on the existing energy efficiency label, which is itself based on luminous efficacy or lumens per watt (see orientation values in tables below). For each wattage category, manufacturers are calling for requirements to become more stringent over time. This step by step approach ensures the availability of practical energy saving alternatives in all domestic applications and is realistic, safeguarding the interests of consumers, employees and Europe's lighting supply chain

Lamps that do not carry the EU Energy Label¹² are not in the scope of this proposal. Proposals to tackle reflector lamps, which make up the remaining 15% of the incandescent lamp market, are being also prepared, based on the same approach.

To ensure continued quality and cost effectiveness for Europe's consumers, all lamps placed on the EU market should also have to have a minimum rated lifetime of 1000 hrs and comply with relevant IEC and CEN standards.

Which CFLi lamp should I buy to replace a 60-, 75-, 100- or 150-watt regular lamp?

Can you DIM CFLi's?

Are new lamps bad for my health?

For answers to these questions and much more see our Frequently Asked Questions: www.elcfed.org

Typical Wattages and proposed lm/W values per phase*

Lamp Category	Phase 1 2009	Phase 2 2011	Phase 3 2013	Phase 4 2015	Phase 4+ 2017**
>100W	18 lm/W	20 lm/W			
100W		14 lm/W	17 lm/W		
75W		14 lm/W	16 lm/W		
60W			13 lm/W	15 lm/W	
40W				11 lm/W	14 lm/W
25W				10 lm/W	12 lm/W

*Typical Wattages and proposed lm/W values per phase: Valid for 220 to 250 volt mains supply; Lamp minimum rated lifetime threshold = 1,000 hrs; For other wattage levels the exact lm/W value is defined by Directive (98/11/EC).

**Phase 4+ 2017 - Notes the additional improvement for lamp category 40W and 25W.

Stimulating the Demand for Energy Efficient Lamps

There is considerable evidence that in the effort to change consumer behaviour to a lower carbon lifestyle, better results come from encouraging positive change rather than penalising existing behaviour.

In addition to legislative tools setting mandatory efficiency standards for lamps, we are working on policies and measures that focus on encouraging the most efficient lighting products at European, national, regional and local levels. These include: awareness raising campaigns, the use of updated building codes, green procurement and the use of appropriate fiscal instruments.

This wide range of possibilities has been given further focus by the obligations on Member States under the EU's **End-Use Energy Services Directive** to their own **National Energy Efficiency Action Plans** (NEEAPs). Through our Roll-Out Member State Programme¹³ (ROMS), we are working to encourage policy makers to develop plans in all EU member states that assist the market transformation to more energy efficient products. We will be looking to further strengthen these measures in the next plans (due in 2010) and of course will do our best to ensure that these plans are executed.

Energy Efficiency Class - proposal per phase*

Lamp Category	Phase 1 2009	Phase 2 2011	Phase 3 2013	Phase 4 2015	Phase 4+ 2017**
>100W	ABCD EFG	ABC DEFG			
75W+		ABCD EFG	ABC DEFG		
60W+			ABCD EFG	ABC DEFG	
25W+				ABCD EFG	ABC DEFG

*Energy Efficiency Class – proposal per phase: Valid for 220 to 250 volt mains supply; lamp minimum rated lifetime threshold = 1,000 hrs.

Products with EEL in red, supported by binding legislation, shall not be placed on the EU market from the specified year.

** Phase 4+ 2017 – Notes the additional improvement for lamp category 25W+.

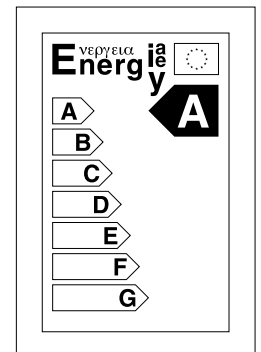
¹² The EU Energy Label rates products from A, (the most efficient) to G (the least efficient). For lamps the EU energy label goes from up to A to G. in all EU Member States by law, the label must be shown on all domestic lamp packaging.

Building and improving consumer awareness

We are working to improve consumer awareness by:

- Promoting and improving the understanding of labelling schemes. The EU Energy Label rates domestic lamps from A to G. In all EU Member States, the label must be shown on all domestic lamp packaging.

- The EU energy label also gives the most accurate indication of the carbon footprint of a lamp. The carbon footprint of



¹³ <http://roms.elcfed.org/>

a lamp (i.e. the total amount of carbon dioxide or CO₂ and other greenhouse gases emitted over the full life cycle of a lamp) differs considerably to that of other products, particularly those which require energy or electricity to function. Whereas for most products, the greatest environmental impact occurs during resource use, production, transport and disposal phase, lamps create most of their greenhouse gas emissions (up 90% depending on the lamp type) during their use phase, i.e. when they are switched on or illuminated.

- Additional carbon footprint schemes for lamps would be counterproductive. Lamps marked with A have the lowest carbon footprint, lamps labelled G have the highest carbon footprint.
- Working with our international colleagues on a global harmonization of energy efficient lamp criteria for CFLs in order to increase consumer confidence and harmonise performance.
- Providing support to our own lighting 'value chain' so that they too have the information required to mobilise their own customers to purchase energy efficient lighting technology.
- Working with consumer and environmental groups as well as retailers on public information and media campaigns on energy efficiency.

Greening Europe's buildings

We want to help **green Europe's buildings** by:

- Encouraging Member states and the European institutions to lead by example by improving existing lighting technology in their own buildings and demonstrating to the public the benefits of making the switch.
- Providing input to the revision of the Energy Performance in Buildings Directive (EPBD) so that future legislation is revised to apply to ALL buildings, not just those above 1000 m².
- Ensuring that all European buildings comply with strict daylight control criteria for rooms with daylight penetration, and presence control criteria (such presence controls for rooms where people are not permanently present, and switching controls for rooms which have a specific function over a predefined period or a combination of all), as set out in European standard EN 15193.
- Ensuring that architects, designers, contractors, real estate professionals, and other businesses and organizations involved in sustainable design, building & development have the right information about energy efficient lighting - alternatives, functionality and savings potentials.

Encouraging Europe's public purchasers to lead by example

We are encouraging Europe's public purchasers to take a lead by setting an example – through encouraging **green procurement**. This will not only send a strong signal to others that they are serious about what they say but also make a significant contribution to solving the problem.

- We call for all EU member states to include energy efficiency and installation criteria for new and existing lighting systems in all national procurement specifications for

public buildings and public street lighting¹⁴ systems based on compliance criteria from the European road lighting standards series: EN13201-1, -2, -3 and -4, which will under our plans also include mandatory energy performance criteria.

- We seek insurance that all existing street and office lighting systems are audited AND non-compliant lighting systems are to be renovated in line with these standards. We will also continue to support municipalities to overcome the administrative and cost barriers of upgrading or renovating to energy efficient technologies such as lighting through:
 - Acting as a bridge to Energy Service Companies (ESCO's)
 - Promoting Public Financing Initiatives (PFIs) or Public Private Partnerships (PPPs) to encourage financing mechanisms and energy efficiency initiatives
 - Providing them with practical information; advice and training on how make energy efficiency improvements through lighting through for example our BUY BRIGHT programme: <http://buybright.elcfed.org>



BUTK
Bottom Up to Kyoto

The ELC with support of the Intelligent Energy Europe Agency (IEEA) and in conjunction with partners from 5 new EU member states (Voru in Estonia; Riga in Latvia; Raciechowice in Poland; Cluj in Romania, and Slovenska-Bistrica in Slovenia), is working to address the market barriers for public lighting under the 'ButK' projet.

For more info see <http://butk.elcfed.org>

Closing the investment gap

Finally, coupled with the measures above, we want to ensure that **fiscal instruments**, ranging from reduced VAT rates or subsidy mechanisms, are used to compliment or to remedy the failings of the efforts outlined above to overcome the barriers to much greater uptake of energy efficient lamps.

In the case of lighting in the home, we believe that fiscal instruments should only be considered where the portfolio of other policies that are already being successfully and quickly applied are not achieving their desired objectives.

The most effective, practicable and rapid way to enable consumers to make better choices for their own budgets, the EU economy and the global climate is a phase-out of the least efficient products destined for our households. This is being achieved as quickly as practicably possible through the EU's EuP Directive where a specific Implementing Measure could start a phase-out in 2009 and alone achieve the full potential of emissions savings by 2015.

National environmental taxes on inefficient lighting for the home will not only duplicate the effort under the EuP Directive but could adversely and unfairly distort supply of alternatives. They also risk adverse public reaction, especially where proposed measures are not clearly fiscally neutral and set within a long-term, strategic shift of taxation from labour to resources to achieve a low carbon economy. Such environmental taxes on lighting for the home should therefore not be a short-term priority in the EU.

¹⁴ Contain compliance criteria from the European road lighting standards series: EN13201-1, -2, -3 and -4.

To strengthen awareness campaigns and energy labelling, positive fiscal measures, such as reduced rates of VAT on the most efficient products, on the other hand, could provide a potential incentive for consumers to switch quickly to the best options. However, these measures should be applied in a co-ordinated way across the EU in order to avoid distortions to the Internal Market and unnecessary additional administrative costs on the supply chain.

CONCLUSIONS

Europe has great potential to rationalise its energy use; however we still squander enormous amounts of light and energy from old and energy-inefficient lighting systems each year. As standards of living rise so will demand for lighting, further increasing the threat of accelerated climate change.

The ELC is committed to helping Europeans make the switch to more efficient lighting. We believe that the only way to change consumer behaviour to a lower carbon lifestyle is through a combination of measures at a European, national, regional and local level:

By setting mandatory efficiency standards for street, office and domestic lamps under the EU's Eco-Design of Energy-using Products Directive (EUP) that will, in time, restrict the **SUPPLY** of the least energy efficient products to the European market by 2009.

By ensuring our member companies commitment to increase their energy efficient product ranges, provide alternatives for all existing applications, and further invest in innovative lighting solutions.

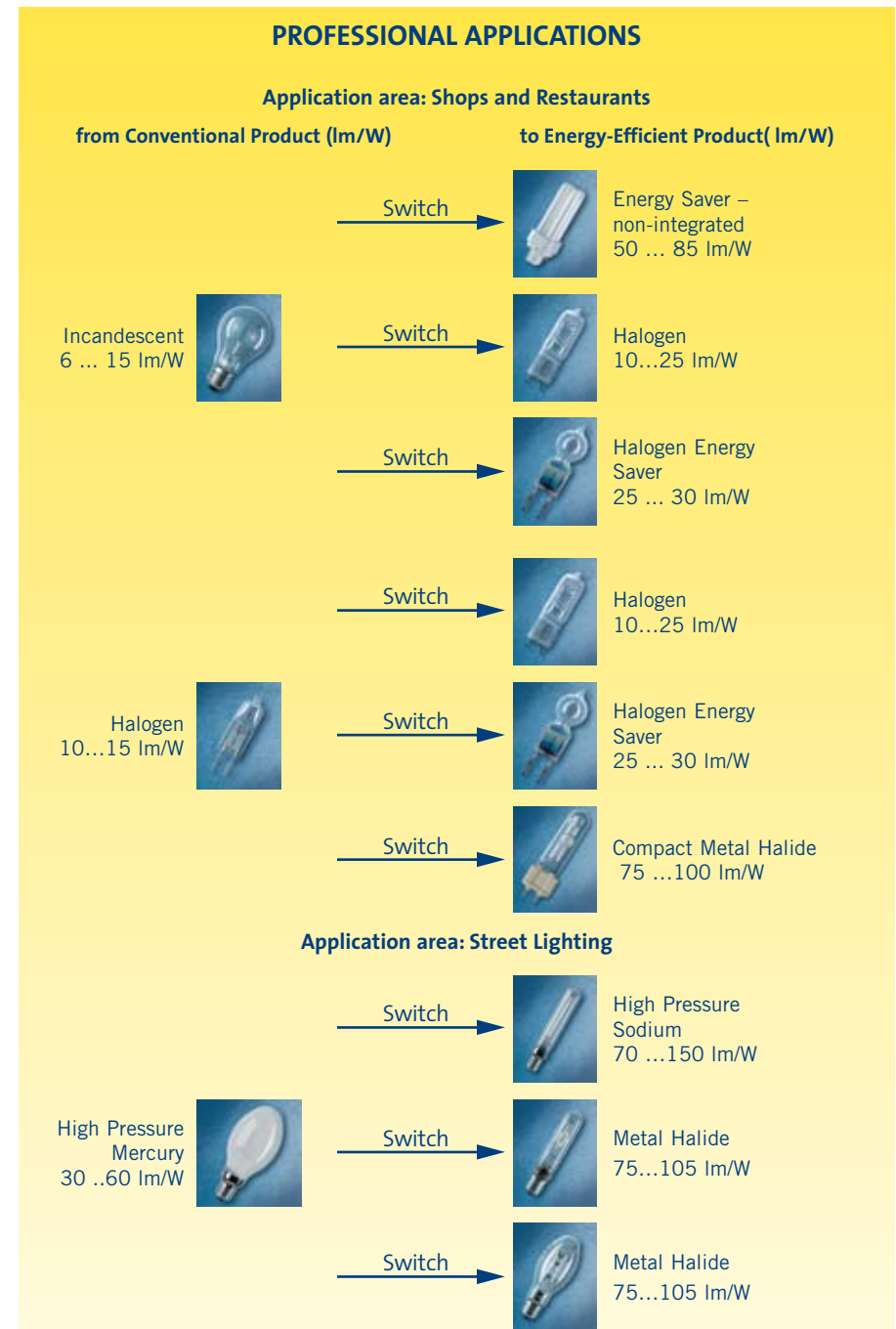
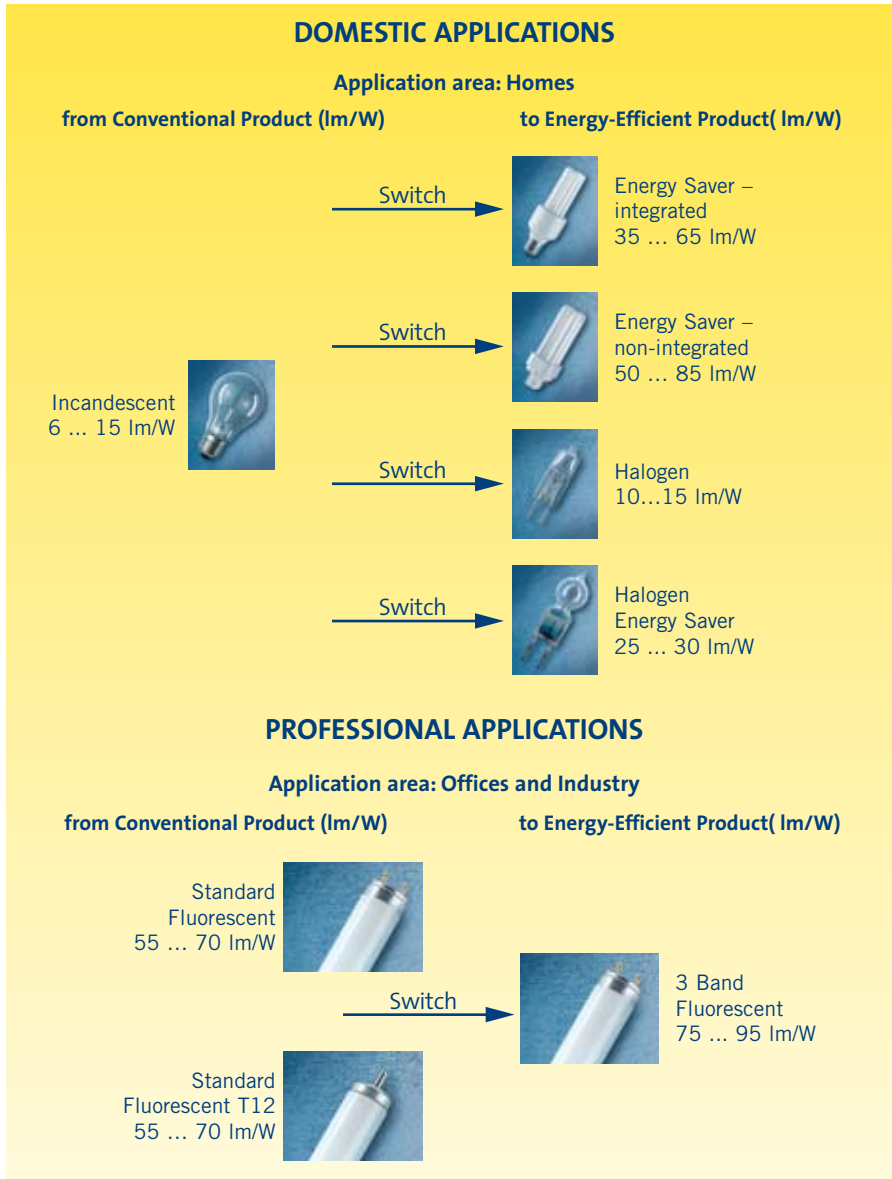
By stimulating the **DEMAND** for energy efficient products at all levels (European, national, regional and local) through:

- Working to improve awareness about the environmental, esthetical and economical benefits of energy efficient lighting through targeted communications campaigns to all end users (private and professional).
- Greening Europe's buildings by encouraging Member states and the European institutions to lead by example, ensuring that all European buildings comply with strict daylight and presence control criteria and making sure that other businesses and organizations involved in sustainable design, building & development have the right information about energy efficient lighting.
- Encouraging and helping Europe's administrations (European, national, regional and local) to take a lead by setting an example, include energy efficiency and installation criteria for new and existing lighting systems in procurement specifications and audit and renovate non compliant lighting systems.
- Last but not least, coupled with the measures above, we want to ensure that fiscal instruments, such as reduced VAT rates or subsidy mechanisms, are used to compliment or to remedy the failings of the efforts outlined above to overcome the barriers to much greater uptake of energy efficient lamps.

We believe that measures such as the ones indicated in this road map could be undertaken quickly and effectively to make a difference to the uptake of energy efficient products and are the best way to get results. This is a small investment today for a substantial return tomorrow.

The ELC - Helping Europe to Make the Switch

HOW MUCH CAN BE SAVED THROUGH ENERGY EFFICIENT ALTERNATIVES?





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