

PROMOTING HIGH QUALITY CFLs ACROSS EUROPE: THE MAJOR OUTCOME FROM EnERLIIn PROJECT

Georges ZISSIS^{1,2}, Patrizia PISTOCHINI³, Simonetta FUMAGALLI³

¹Université de Toulouse, France; ²CNRS LAPLACE, France; ³ENEA, Italy

Abstract. *To ensure a sustainable growth and use of Compact Fluorescent Lamps we propose to develop valid promotional arguments and implement coherent promotional campaigns; to train end-users in order to achieve a self-sustained CFL use growth. To achieve considerable savings in this sector, a coherent strategy is required to transform the lighting market. To ensure a sustainable growth and use of CFLs, the partners of the European Efficient Residential Lighting Initiative (EnERLIIn Project EIE Programme, SAVE) have developed valid promotional material and implemented coherent promotional campaigns to inform and train end-users in order to achieve a self-sustained CFLs use growth. Thus, EnERLIIn project objectives is to substantially increase the efficiency of residential lighting in a number of Member States and Candidate Countries, through increased penetration of CFL's in the residential sector. This paper give some insight on results obtained by this 3-year project that execution has been achieved in December 2008. The results presented here are mainly concern the analysis of CFL market barriers and especially quality issues as well as dome examples of CFL promotional campaigns that have been undertaken in order to discard the barriers.*

Keywords: CFL promotion; Energy Efficiency; CFL quality

Introduction

Lighting consumes 14% of all electricity consumption within the EU and represents a big energy saving potential still of 20% on all the lighting currently installed in Europe. Old and inefficient lighting technology consumes large amounts of unnecessary energy, creates a cost burden both for local authorities, business and tax payers and produces large and unnecessary amounts of CO₂. Furthermore, energy savings from CFLs, by replacing only one additional GLS lamp by one CFL per household a gain of 11 TWh corresponding to 1.2 Mtn of less CO₂ per annum can be achieved.

To achieve considerable savings in this sector, a coherent strategy is required to transform the lighting market. The consortium work is focussed on the better promotion of Compact Fluorescent Lamps for residential use. The overall project objective is to substantially increase the efficiency of indoor residential lighting in a number of EU Member States, through increased applying of CFLs in this sector.

EnERLIIn project used the maximum of the consortium competences in order to address the following issues:

- Quality standard: The output from the European CFL Quality Charter is now updated and used, in addition several

consortium members are National Energy Agencies and they have the possibility to transpose CFL-QC standard in their countries.

- Identify Negative arguments that potential individual users may oppose to CFLs, this issue is perfectly addressable in EnERLIn by passing through surveys and questionnaires individual users as well as to professionals that they are in contact with clients and collect “complaints”.
- Scientific Arguments: The consortium includes some academic institutions that are contributing to the elaboration of unified protocols that should be used in test centres. In parallel, some consortium members have yet CFL test installations that may be used for the project aims. Finally a unique test facility has been created under the coordination of the academic institutions and with the collaboration of National Energy Agencies.
- Training: The consortium has all necessary competence in this domain. Academic institutions can help to the creation of curricula and test them in local scale. The definition of these curricula is done jointly with all other members of EnERLIn consortium who are aware of real needs in the domain. ENEA created the e-learning modules supervised by academic institutions.

Attractive material for promotional campaigns for CFLs: The consortium used all collected material and experience in order to define promotion campaign scenarios. The consortium defined the type of promotion media that driven each campaign. Some preliminary tests-campaigns have been executed in small scale in order to test a concept before use it in a real scale

operation. Thus, all parameters concerning the campaign have been tuned and then the promotional material creation was outsourced to communication professionals.

Analysis of barriers for further implementation of CFL's

An important task in the frame of EnERLIn was to understand why end-user avoids (or dislikes) CFLs for residential use. Analysis of possible barriers to implement CFL's has been carried out in order to understand the human mechanism regarding willingness and avoidance to implement CFL. The result showed that around 30% households do not want to have CFL's in their home and that reasons for not having CFL's are many. Further a range of action plans for increasing the use of CFL's in Danish households has been evaluated and a realistic potential for increasing the number of CFL's has been considered.

The consortium compiled information, from various sources including direct population inquires, and established the following list of barriers:

- Consumer dislikes classic CFL shapes, and, CFLs misfit often to “design” luminaries
- Consumer dislikes colour temperature & rendering of CFLs
- Good quality CFLs are still expensive, and, inexpensive CFLs aren't reliable
- Return time on the consumer's investment is short but not directly observable in a periodic electricity invoice
- Plug & Play CFLs aren't dimmable
- Consumer need all light instantaneously but CFLs need time to warm-up

- CFL dislikes rapid (or random) ON-OFF cycle and is incompatible with presence detectors
- CFL power supply dislikes mains voltage fluctuations
- Payback period can be long when electricity price is artificially low (this the case of some eastern countries)
- Some concerns about UV radiation escaping from the tube are also expressed.

It should be noticed that beyond classic barriers identified up to now, a new one appeared during the last months: danger due to electromagnetic wave interactions with the human tissues. This has been put in front from some NGOs especially in countries like France; however, there is any plausible proof of any danger linked to the power supplies incorporated in the lamp cup.

Another point that seems to cause problems for CFLs is that they contain Hg. This is of course true but it should be known that if Hg-free lamps (using essentially Xenon) replace existing CFLs the energy quantity necessary, for producing the same quantity of light, would be multiplied by a factor of 2-2,5. Today, the quantity of mercury inside CFLs is in net decrease (in the order of 2 mg/lamp when EU RoHS allows a maximum of 5mg). In addition, all EU countries have CFL recycling obligations. In many cases (France, Germany, UK...) the recycling circuit is well organized and effective. For example in France Recylum, within just few years since its creation, recovers and treats more than 30% of mercury-congaing lamps It is clear that in this domain more information in destination of the end-user is necessary.

The first results from the questionnaire distributed before and after the Jelgava

campaign in Latvia pointed out that efficient information could wave-out some "barriers" like shape but then, as shown the Figure 1, consumers become more demanding on Quality and colour issues. In many western countries, CFLs residential end-users are much more concerned by the light quality (colour temperature, colour rendering, light stability) and lifespan than CFL retail price. In contrast, in Eastern countries, like Latvia, price is still the major brake. However, in Bulgaria, the main reason for customer dissatisfaction is the low quality and low lifespan of the lamps. In fact, in Bulgarian market customers could find mainly cheap but low quality CFLs. Usually these low quality lamps are coming from small factories in Far East countries that don't respects international manufacturing standards. In fact these low quality products flood the market and damage seriously CFL reputation to the eyes of the individual end-user; this is a major issue for all countries. It should be noticed also that we observed that almost half of the probed population are not aware of the fact that the saving allows the recovery in a year of the initial whole investment. Again, reliable information is cruelly missing.

We found that people with high educational level know about CFLs use them extensively even if there is some concrete dissatisfaction due to both low light quality and unexpected low lifespan. It should be also noticed that especially the elder population is not informed about CFL (thinking the price is 3 or 4 times higher than it is actually in shops), and that is why they do not use them. However, for people staying at home most part of the day, power savings and costs could be very significant.

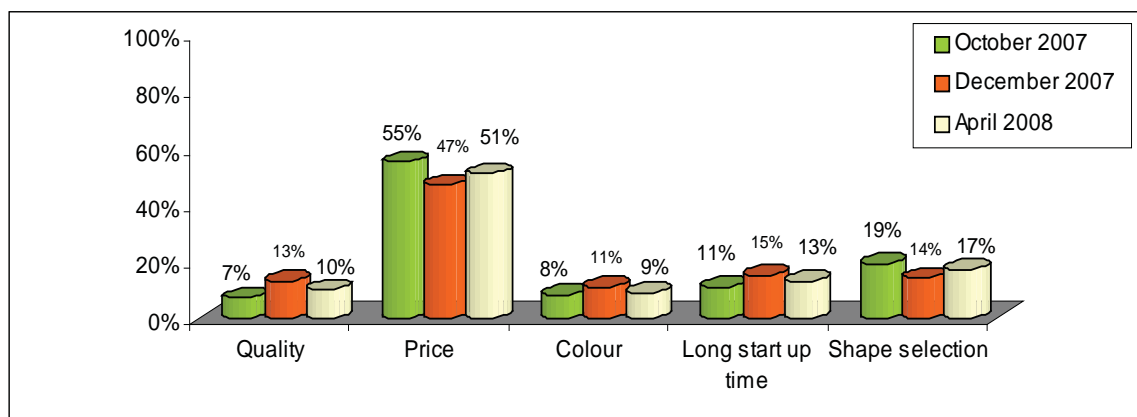


Figure 1 Answers on market barriers as obtained in Jelgava (Latvia)

CFL-Quality Check & Monitoring

A CFL-Quality monitoring has been carried-out in ENEA (IT) and UPS (FR). The monitoring campaign has been performed during one year. The tests aimed to evaluate the ageing of CFL in a simulated real-use environment, and are based on EU standards and Quality Charter. Tests are performed on more than 100 CFLs (the most common powers) from different brands, under different environmental conditions (i.e. in climatic chamber).

Both partners worked on the establishment of a common testing method. This method is directly inspired by EU standards and CFL Quality Charter requirements. The following quantities have been monitored:

- Light output is measured at the beginning phase of the tests (after initial controlled ageing of 100h) and then regularly checked.
- Lifespan for series of on-off cycles operated
- At the end of the test light output (on the survivors samples) is performed again.

- Colour coordinates and colour temperature variations.

The tests evaluated the behaviour of CFLs with ON - OFF operation, under different temperature stress (i.e. very cold, e.g. balcony, garage, outdoor in winter time or very hot, e.g. closed luminaire in a kitchen during summer time...). Different testing condition and cycle sequences have been investigated, following the CFL quality Charter and then the Directive 2005/32/EC (Ecodesign for Energy Using Products) voted on Dec. 8, 2008.

Results are available for cycling sequences:

- according to Quality Charter (5 min ON, 10 min OFF, 25°C ambient temperature)
- Ecodesign (1 min ON, 3 min OFF, 25°C ambient temperature)
- with cycles 5 min ON, 10 min OFF, 40°C ambient temperature

The figures 2a and 2b illustrate some of our results for light output depreciation of various CFL brands (under standard cycle as defined by EN60969) as well as the failure rates under various fast ON-OFF cycles. In

all cases rapid ON-OFF cycle is linked to higher failure rate but the increase of failure rate is moderate in the case of high quality lamps. The increase of failure rate can be explained by the fact that in rapid ON-OFF cycle electrode sputtering is increasing (especially when electrodes are cold on/and not preheated). Low quality CFLs are using electrodes coated to an uncontrolled way and this is directly responsible for more failures under the same conditions.

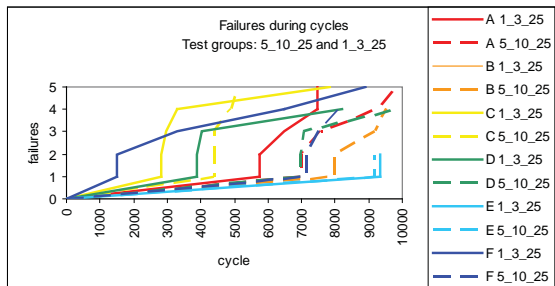


Figure 2a Failures observed as function of lamp age for different ON-OFF cycles. A, B,...F correspond to various brands. The numerical notation “x_y_z” correspond to: x: ON time in minutes; y: OFF time in minutes, z: testing temperature

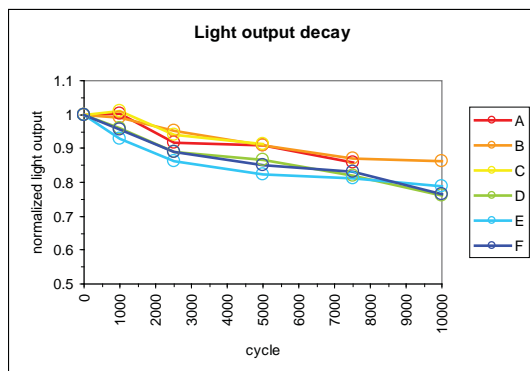


Figure 2b Lumen output depreciation as function of age for different brands under standard ON-OFF cycle

High Quality CFL Database

EnERLIn consortium produced databases with high quality CFLs and luminaires. Both databases are searchable and accessible via the project web page.

The High Quality CFL Fixture Database is made based on existing inventories of such luminaries, but mainly on the input from the lighting manufacturers and their trade associations in the EU. A crucial target was an excellent quality of the interior pictures of the fixtures, in order to have a tool which can and really should be used by consumers and lighting specifiers to make a (first) selection of (a) fixture(s). A database has been created (www.e-ster.be/enerlin) and a selection of energy-efficient lighting fixtures has been put into it. The database contains 122 suspended fixtures and 16 up-lighters; for each entry the following data are included:

- one or more pictures
- the name of the lighting fixture
- technical information (type and number of lamps, colour, description)
- the advised price
- the contact data of the manufacturer.

In parallel, within the German climate protection campaign “Klima sucht Schutz”, we developed an online-tool: the “High Quality CFL Database”. This database gives technical characteristics of about 300 compact fluorescent lamps and halogen spots in both English and German languages. All listed CFLs respect the rules imposed by the CFL quality charter.

The online tool helps to find the appropriate lamp and compares several lamp types with each other and reveals energy saving potentials. The Federal

Ministry for the Environment promotes the publication of the online offer.

This database is similar to the database for energy efficient light bulbs developed for TopTen (<http://www.guide-topten.com/>) but it is fundamentally different that because its aim is to include a number of CFLs as large as possible and not only the 10-best examples. The products are ranked by efficiency and it is possible to do direct comparison of 2 - 3 products. Comparison of life-cycle-costs, based on: Energy consumption; Retail price; Typical usage and energy prices. Today, 2,000 to 5,000 connexions are registered per month.

Promotional campaign Design

The most important outcome from EnERLIn project is the design and testing of various CFL promotional campaigns. it is important to realise a promoting campaign in order to better present and inform the end-users about the qualities and benefits of CFLs.

To achieve this objective several steps were necessary:

- Probe the end-users and retailers using specific questionnaires in order to be able to evaluate campaign impact.
- Elaborate various campaign scenarios adapted to different target populations.
- Creating attractive promotional materials and tools.
- Collect results and analyse the impact for different campaign strategies.

Questionnaires are an easy way to gather information. We believe that we can collect mostly qualitative information from questionnaires, rather than quantitative information. The questionnaires, if there are

well designed could then provide very useful information on the following points:

- Segmentation of the market
- Knowing and using the object
End-user behaviour knowledge: future purchase and influencing factors
- Experience and satisfaction of the user
- What are the preferred information sources

This way has been chosen inside the EnERLIn project to collect information on CFLs in household environment from two different points of view: those who use CFLs (end-users; the demand side) and those who offer CFLs (manufacturers, retailers etc; the supply side).

One important outcome from EnERLIn project is the creation of a document that includes various questionnaires for end-users and CFL-professionals. Partners develop the questionnaires in various languages for covering various situations. This global document is available in the project web page.

Exemples and lesson learnt from national campaigns

The objectives of the German Campaign were the dissemination of efficient lighting systems in private households and also in the tertiary sector. The campaign “energy saving lighting” pursued the following targets:

- Improvement of the information and motivation about technologies and implementation strategies for efficient lighting for private users, decision makers of public authorities as well as companies in the service sector and industry.

- Overcoming of implementation barriers for the utilization of CFLs and lighting refurbishment.
- Support of marketing activities of lighting services companies due to their key role in lighting refurbishment.

A series of workshops about energy efficient lighting has been held in five regions in Germany in cooperation with regional partners. The target group of the series were public authorities. The direct addressing of target groups was complemented by initial consultations to topics such as financing, funding, and technical implementation. The consultations focussed on the implementation of good practice examples.

The campaign improved the marketing activities of manufacturers and energy service companies (ESCOs).

The participants of the campaign reported their appreciation of Best Practice, workshops, CFL Data Base and considered it important for the energy efficiency in lighting systems. Good-practice examples are currently not very well known and we can consider that the German campaign has improved the communication of such to a high extend. Private consumers are interested in information about the quality of CFLs, affection by switching and colour rendering.

Latvia carried out a CFL promotion campaign “More light for less money” in the municipality of Jelgava. The main promotional activities concerned:

- Drawing, comics and energy saving calculations competitions for school pupils.
- Information days for Secondary schools.

- Informative stands in Point Of Sale (POS) and workshop for POS people.
- Distribution of booklets for inhabitants of Jelgava.
- Information about campaign in mass media.

Campaigns in schools involved 605 pupils, distributing posters and booklets completed with important information about efficient lighting and CFLs and what to do with the end of life bulbs. During the campaign, not only the pupils have been informed about energy efficient lightening, but also there teachers and other people that came to the schools. And one of the best ways to change people behaviour and think environmental friendly is to start with children because they are open to new information and can also affect their parents’ opinion. A campaign-closing event was organized including the award of winning pupils that participated in the competitions and a summary of all activities that carried out during the campaign.

Ten shops from Jelgava decided to participate in the campaign and put in the shops informative stands with booklets about energy efficient lightening and energy efficient lamps with action prices. For the campaign on the streets about 20 000 leaflets have been prepared and distributed by campaign endorsers with the campaign T-shirts.

During the distribution also explanation to people about the aim of the campaign and about energy efficient lamps were given.

To reach a wider audience about the campaign information about CFL and energy efficient lightening campaign “More light for less money” the Mass media such

as Newspapers, Radio, TV broadcast and home page of the Municipality were involved. The campaign involved Philips Latvia, Osram, Ekogaisma and Plaza, which sponsored with free CFLs and reduced prices. The positive results of the campaign impact to citizens, shows that such campaigns are needed and can be implemented in other municipalities.

Italy performed two campaigns: The first was dedicated to a face-to-face promotion of the CFLs and organized in occasion of the School Day held in Italy on the 23rd of March 2008, where ENEA, the JRC of Ispra and Teaching Regional Direction collaborated. Over 1100 children from 25 Italian schools visited the JRC-Ispra site. The young guests in the age between 9 and 18 and each of their schools were given the opportunity to choose the laboratories, installations and presentations they wanted to see. More than 250 students coming from secondary schools and higher education, divided in 6 groups attended the Laboratories of ENEA.

At that occasion, the questionnaire has been used. It was prior sent to the teachers in order to make the students fill them out before the visit. More than 150 students handed them back and received a free CFL and the booklet "Energy saving with lighting" edited by ENEA. The evaluation of the questionnaire reported that the total lamps installed are in average 20.5 out of which 4.1 are CFLs and most of them are installed outdoors. The majority of the families were satisfied with CFLs' light intensity and lifetime, 44% with CFL light colour.. Negative comments were addressed to a "too cold light" from CFLs. In addition, final users reported that slow

switching time could be seen as an "inconvenience". However, it can be accepted in name of environmental and economical benefits. A change of habits was observed: Lights are always switched "ON" for at least 5 minutes and they are switched OFF only when nobody will reasonably use the room anymore. This change of behaviour is linked to the fact that end-user is more and more aware about the problems arising with rapid ON-OFF cycles. However, this change of behaviour could have a negative impact on energy consumption. An estimation of the energy use should be performed taking into account the usual lighting durations observed in various rooms (living room, toilets, kitchen etc...), unfortunately this a very hard task because crucial and reliable data are missing.

The second Italian action was a web-based campaign using the ENEA developed e-learning platform (<http://odl.casaccia.enea.it>). This campaign was addressed at national level several categories of individual end-users (students, teachers, citizens, decision makers) as well as institutions like Universities, schools and training other organization. The web campaign involved 388 users coming from all over Italy. With respect to the education level, 62% of the users had a University Degree, 34% came from high school. Of them 69% were engaged in technical field.

In Poland Approximately 100 000 final users have been reached by the CFL campaign. The campaign was successfully as defined in general education program base. It was not so easy to discover financing way to continue the campaign around whole country. More especially, we prepared and produced a

wide promotion campaign around schools. Energy efficient lighting problems are interesting for students but not well known so far. The project realization has not only educational value but school society integration feature too. Teachers and students have assessed the concept of the module "Efficient lighting" and its utility in the educational process with high importance.

A training day was organized for 600 teachers giving them the set of the materials (DVD film, Guidebook for students, Guidebook for teachers, poster). Over 20 thousand students received the information regarding CFL usage at home, climate changes and GHG emissions. Afterwards, a CFL Promotion campaign "Effective lighting", was prepared in five schools for two education levels: a secondary school and a higher education.

The module "Efficient lighting" has been defined as evaluation object. The procedures used to collect the information are Interviews with the teachers and students, Observation of the activities carried out at the chosen schools and questionnaires completed by the teachers together with students using the module "Efficient lighting".

In Sweden, Respect has made a priority to bring the main partners together to create a platform for a successful implementation CFL campaign across the country and coordination with international partners. The design of a campaign for Swedish market together with the Swedish Energy Agency was based on standards for CFLs. A platform for standardization guidelines was prepared for the implementation of a strong network with the distributors of CFLs. A promotion and standard leaflet

was designed, based on a Danish leaflet and printed in 25 000 pieces and later up to 150 000 pieces). The leaflets were distributed through the market partners as IKEA and other retailers. A follow-up meeting was held, with the purpose to establish a standard market group with members from all main retailers. The brochure titled "Energy efficient and good residential lighting", guides the readers to successfully illuminate their homes "function by function" and "room by room". In 2008 this brochure was disseminated to 900 000 clients of the largest Swedish utility Vattenfall. Furthermore, Fortum another large Swedish utility disseminated the brochure to 850 000 of its clients. Amongst the housing societies HSB through its 3900 housing society members disseminated the brochure to over 200 000 of its condominium owners.

In addition the "Road to Copenhagen" event has played an important role in spreading the message from the EnERLIn project. The website was viewed by 2722 visitors coming from 77 countries. The conference "Road to Copenhagen" held in Brussels reached also more than 150 decisions makers.

Danish Energy Association stated that they were not able to carry out an information campaign but they have calculated six possible scenarios stating that scenario analysis is a very important tool to get at clear picture of what is reachable in the future CFL market. These scenarios have been developed in order to assess the maximum energy efficiency potential for lighting in Denmark including the maximum number of CFL that can be installed in Danish households. Further

more, the Danish Partner has started a process for Energy savings project including technical development of new applications. The experience shows recommended assessment methodologies for electricity companies working with information campaign activities aiming to increase the penetration of CFL into the market and addressing it to the end-users.

The 10 Bulgarian Campaigns organized by Sofia Energy Centre were called “quality” and addressed citizens, decision makers, installers, other professionals and sellers. The CFL campaign was addressed to about 2.5 million of final users through leaflets, TV broadcasts and newspapers. The Bulgarian partner involved the ENERLIN Consortium, the National Committee on Illumination and CEZ Electro Bulgaria. A successful element of their activities was the increased market of CFLs by 15%, a weak element the higher price of CFLs. In the future, they are planning to phase –out Incandescent Lamps.

The end-users inquiry was executed through random telephone calls. The number of people contacted was about 500, from them 200 replied. The main conclusions are:

- 74%, of the population do not have a single CFL;
- The average number of lighting points in a household is 14;
- The average number of CFLs for a household that has such is 2.5 lamps;
- To the question “Do you know anything about CFLs” 60% of the questioned people responded “Yes” and 40% responded “No”
- 80% are not satisfied with the CFLs.

A second inquiry was addressed to the importers, retailers, architects and designers. Of all the questionnaires handed out, 20 returned filled in. The following results from the inquiry should be underlined:

- The ordinary incandescent lamps have the biggest share on the market. Second come the halogen lamps, and third – CFLs.
- To the question “To what an extent do the existing luminaries for incandescent lamps prevent their change with CFLs?” 21% replied to a large extent, 43% think that this is not of such a great importance and 36% that this is not a big deal.
- In recent years, mainly the low quality manufactured lamps were sold because of their low price. Their bad reputation, however, decreased people’s interest towards CFLs. At present, the interest towards quality European lamps is growing.

The Czech republic CFL Campaign reached over 4 million final users at national level. Philips Lighting Cz, Osram Cz, Ekolomp and South Bohemian Regional Energy Agency were involved. Philips, Osram, Ekolamp and the Ministry of Industry and Trade sponsored the initiative co-financing the production of promotional materials (leaflets and info packs). On the web, promotion of the good quality of CFLs was made. Eight types of leaflets were printed and distributed, over 50 articles were published and TV and Radio involved.

In addition a specific survey has been implemented in two specialized shops on the light sources and lamps, with high expertise and assistance availability. The target group

was educated consumers, often professionals, who visit these shops. However, they also include general public. The survey was undertaken in the period of January – April 2007. Up to now, 2000 copies of papers have been distributed and some 400 have returned. The inquiry showed that some two thirds of the survey participants do have at least one CFL at home. From those households, which have at least one CFL at home, they have on average 3 pieces of CFLs installed. On the other hand, in a typical household the number of light points is 15, so there is a definite potential for at least some more CFLs to be installed. Regarding the qualitative aspects of the CFL usage, only one third of respondents feel that they have sufficient information on the CFL quality aspects. Some 66% think that the shape of lamps and luminaries prohibit the wider usage of CFLs. A majority of the respondents agrees that CFLs reach the declared lifetime (70%), and that the higher purchasing price is appropriate (62%). Of the respondents, 65% do like the colour of light of the CFL bulbs and 40% consider the energy efficiency to be as high as declared.

In Romania, the technical University of Cluj Napoca was partner of two programs, namely EnERLIn and CREFEN, targeted to the energy efficiency in residential buildings lighting. Subcontractors were involved in the survey and the dissemination of the activities. The campaign organized addressed end-users, dealers, architects and electric and lighting installations designers. The questionnaires for end-users were designed in such a manner that half part remained to the people as an information support on the

EnERLIn programme, the parameters and advantages of the CFLs use. The main difficulties in the campaign was to persuade people to answer the questionnaires. Special attention was dedicated to the young generation and the over 50's. Also, special attention was given to the promoters of new projects, mainly for residential buildings, Architects and Electric-Lighting Installations Designers. Thanks to their positions to educate the professionals and to improve their knowledge to promote the CFLs use in residential buildings.

In 7 CFL campaigns, 892 final users were involved. The diffusion was 50% local, 17% regional and 33% national. Furthermore an average number of CFLs per household is 2.8. It has been seen that end users who live in urban areas and those who have higher education mostly know CFLs. They have replaced the normal lamps with CFLs especially in the places where the lamps are mostly used. In rural areas, especially in the villages that are very far away from the city, there is a lack of information concerning the quality of CFLs that leads to not using them. We estimate that elder population is not informed about CFL (they think the price is 3 or 4 times higher than it is actually in shops), and that is why they do not use them. According to the questionnaire answers, people do not know the durability of CFLs the payback time.

The Hungarian partner carried out a national survey to examine the use, the attitudes, behaviour, knowledge of and experiences with CFLs of the consumers. The pilot campaign was organized in 3 different kinds of units of the retail market. Shop assistants were trained, a simple message chosen. Campaign material was

placed at the entrance and at the shelves. In case the customer bought a CFL and filled in the questionnaire, he would get a free CFL. The campaign lasted 3 weeks. In the shop of the GE Lighting - Tungsram, the campaign was successful; customers were conscious and looking for good quality goods and invested in CFLs. In department stores, shop assistants were generally too busy. The only feasible action to promote environmentally friendly technologies was to “hide” the traditional incandescent lamps in low, backside shelves. In hypermarkets, the campaign was a complete failure. Shop assistants did not collaborate with the promotion of CFLs distributing leaflets and information as it was considered as a kind of extra activities.

The inquiry showed that the main reason for buying CFLs is the reduction of energy consumption. It should be noticed that 60% of the people are expecting more reliable information about CFL benefits. In fact, 93% of the people asked found it useful and of high quality.

Conclusions-lesson learnt

EnERLIn project allowed to design and test several promotional campaigns for boosting CFL acceptance by residential users. The campaigns have been specifically designed for reaching various target populations in different European countries. Several million people across Europe have been reached. The collected results allowed to better identifying the barriers that impede CFL acceptance by the population and also probe reactions to various promotional stimuli. The following main lessons are learnt for the 3-year project execution:

- Artificial light generation is a fundamental need for human being. This seems to be a very general lesson, however it has a very strait forward incidence to all Energy Efficient Lighting schemes that can be proposed for implementation: end-user is very conservative and reluctant to new lighting solutions especially when they don't satisfy some aspects related to quality of life. Energy saving due to light is considered as important by population but it pass always is second plan after quality of life and comfort. This implies that, especially in Residential sector any EEL project for market transformation has to take into account this behaviour otherwise it condemned to fall.
- End-user is very regarding on CFL Quality. Low quality devices “pollute” the market and seriously impede the increase of market penetration of that energy efficient technology. A systematic CFL-quality control is imposed in EU level following a well-defined unique testing protocol and associated with readable and compulsory labelling.
- There is a significant lack of knowledge and data on the penetration and the trends in use of various lighting technologies in households. This is especially true in Eastern European countries, therefore it is difficult to clearly articulate what we would like to achieve with a campaign and whom exactly we could target in order to increase efficient light sources penetration.

Today, incandescent lamps are banned and population is somehow pushed to adopt CFLs, however, the lessons listed above have to be taken into account for the promotion of the next generation of light sources: the Light Emitting Diodes. In fact CFLs have been “pushed” to the market when the technology was not enough mature, more than 30 years needed in order to “convince” people that this product is now matured but quality issue still a real problem. We hope that this error will be avoided for LEDs...

References

- [1] Enerlin web page:
<http://www.enerlin.enea.it>
- [2] Pistochini, Patrizia., Zissis, G., Be aware of CFLs: our experience in the implementation of the energy saving lamps' use, Proc. 5th International Conference on Energy Efficiency in Domestic Appliances and Lighting (EEDAL'09), 16-18 June 2009, Berlin (Germany)
- [3] Zissis, G., Ruscassié, R., Aubès, M., Estimating the impact of labeling high quality compact fluorescent lamps on the energy consumption for lighting in the residential sector, European Council for an Energy Efficient Economy Summer Study, pp. 1169-1174, 4-9 June 2007, La Colle sur Loup (France).

Aknowledgements

Authors acknowledge the support of the Intelligent Energy European project “EnERLIn” EIE-05-0176.



Georges ZISSIS
Université de Toulouse;
UPS, INPT; LAPLACE
(Laboratoire Plasma et
Conversion d’Energie);
118 route de Narbonne, F-
31062 Toulouse cedex 9,
France

Born in Athens in 1964, is graduated in 1986 from Physics dept of University of Crete (Greece) in general physics. He got his MSc and PhD in Plasma Science in 1987 and 1990 from Toulouse 3 University (France). Today, he is full professor in the Electrical Engineering Dept of Toulouse 3 University. He is working the domain of Light Sources Science and Technology. He is responsible of the “High Intensity Light Sources” research team that enrolls 15 researchers. Prof Zissis won in December 2006 the 1st Award of the International Electrotechnical Committee (IEC) Centenary Challenge and the Energy Globe Award for France in 2009 for his work on normalization for urban lighting systems. Prof Zissis is deputy director of “LAPLACE”, a join laboratory between Toulouse 3 University, National Polytechnic Institute of Toulouse and CNRS (French National Council of Research). LAPLACE represents a task force of 300 researchers. He acted as Chairman of the European Union COST-529 “efficient lighting for the 21st century” network, which regroups more than 80 academic and industrial institutions from 20 European countries.
contact: georges.zissis@laplace.univ-tlse.fr



Patrizia PISTOCHINI
CNRS LAPLACE; F-31062
Toulouse, France

Born in 1966 in Novara (Italy), researcher in ENEA, degree in Political Studies specialized in economic and political issues and international economical relationship. Management of research activities in order to promote national – regional policies and initiatives, furthermore contribute to the diffusion of national/regional projects including regulations and support mechanisms for clean energy. (Including evaluation of the TEE). Promotion and coordination of the MoU program agreement JRC-ENEA in the field of energy efficiency, RES, hydrogen and fuel cells and SET- Plan. Promotion and dissemination of the Ecodesign Directive, the EU Energy Labeling and Green Procurement to public institutions, private enterprises, associations and end-users.

Simonetta FUMAGALLI

ENEA, Italian National Agency for New technologies, Energy and the Sustainable Economic Development, Italy

Born in Novara (Italy), Oct. 8th, 1956, researcher in ENEA, degree in Physics (1981). Lighting related activities (since 2004). Experimental campaigns on light-pipes, compact fluorescent lamps. Participation to Annex 45 IEA: Energy-Efficient Future Electric Lighting for Buildings and EnERLIn project. Assessment of lighting projects and proposals for Italian White Certification Scheme. Technical support to Italian Government for Ecodesign Directive implementation for lighting products. Research activities, including the realization of case studies, on energy efficiency in industrial buildings and public lighting.

Received: November 20, 2009

Revised: December 15, 2009