

Report of the Solid State Lighting workshop

8 April 2010

Introduction

The European Commission's DG INFSO organised a workshop on April 8th, 2010 with stakeholders from the Solid State Lighting (SSL) industry and interested end-users. The aim was to discuss issues related to a potential call for large scale pilot actions in SSL which could be funded under the Competitiveness and Innovation (CIP) Framework Programme. This report summarises the main points discussed and conclusions reached in the workshop; further details are available in the background document and the position paper of the Photonics21 platform attached.

Why a European approach is needed for SSL

Europe at present is leading in lighting based on its solid competences in this domain, i.e.: the number one and two lamp companies have their roots in Europe, while more than 1000 companies, most of them SMEs, are active in luminaire and lighting design. Photonics is another emerging European stronghold, the industry growing nearly twice as fast as the world market.

Due to the advent of intelligent (O)LED technology new players are entering the market with energy efficient solutions, often however at the expense of the light quality. By combining our established strength in lighting design with our emerging position in photonics, Europe is able to bring superior solutions to the market, offering better quality at a lower carbon footprint.

We need however to act quickly, because other regions are building lead markets with support of their governments. China geared up the "21 Cities programme" focusing on outdoor lighting and has set the ambitious target to boost the SSL export to a 30 billion \$ level, creating 1 million jobs. In the US the Department of Energy (DoE) started an SSL programme covering the complete chain from manufacturing to market based actions and deployment in order to realize the sustainability targets set by the government. Taiwan is heavily stimulating capital investment in SSL manufacturing by creating favourable tax conditions. The Korean government is active on many fronts by granting research subsidies, supporting investments and taking the lead in standardization.

Status quo in the EU and the barriers to be addressed

Although the technical feasibility of SSL lighting is proven in many small scale actions, there is insufficient proof of the market feasibility of this new technology, its return on investment period, and its precise potential for energy savings. The existing demonstrations only focus on one single application, reinforcing the perception that SSL lighting is only confined to niche markets and cannot be applied in the general lighting market at large. Due to the rather small scale of

the existing demonstrations, we lack convincing data on the pay-back time of this technology under real life conditions. In the present actions the involvement of the total value chain is almost non-existent. All stakeholders: the lighting and luminaire industry, the architects and lighting designers, the public and private owners of buildings and infrastructures, the contractors and energy agencies, and last but not least the tenants and end-users, need a deep understanding of what SSL can offer them both in terms of light quality and also economy of operation.

A European large-scale action is needed in order to boost market acceptance by focusing on the impact on the market, the economic viability and the way to market. Such an action must make clear that (O)LED technology serves the needs of the European and global lighting market with application requirements differing from one market segment to the other. Unequivocal proof of savings and return on investment is needed to prove the viability of this new technology. The involvement of all stakeholders in the value chain will be instrumental in creating the momentum needed to reach the ambitious EU targets in energy efficiency set for 2020 and beyond.

Aim of the large scale demonstration actions

The envisioned large scale demonstration actions should aim at:

- testing of intelligent SSL solutions under real life conditions,
- proving SSL's economic benefit and return on investment,
- proving SSL's ecological benefits contributing to the achievement of Europe's 2020 goals.

The real life test should focus both on the performance of state-of-the-art SSL products and on the application of intelligent light management systems in order to assess the life cycle and reliability of these solutions. The development of a quality label for SSL products based on the outcomes of the large-scale action would be highly instrumental in creating wide-spread market acceptance. Such an action would require the development of test criteria and procedures in co-operation with the existing standardization bodies. Above all, these tests would give valuable input on the end-user acceptance of the envisioned solutions.

The outcome of the demonstration actions would be factual proof of the energy consumption reduction on the one hand and of the reduced maintenance cost on the other, convincingly proving the projected returns on investment and payback times. The development of new business models to guarantee cost-neutral investments in SSL for public and private users will largely contribute to the market uptake of SSL technology. The involvement of national and regional energy agencies and contractors in the dissemination of the results will also be instrumental in the proliferation of this new way of lighting.

The actions will also contribute to the development of standardized and uniform measurement methods in order to assess energy savings and carbon footprint reduction. With these

methodologies to hand, compelling data can be generated for the different lighting applications. Only in this way it will be feasible to project with sufficient accuracy to what extent intelligent SSL lighting, once fully deployed, will contribute to the EU targets. The public awareness on energy efficient LED lighting could be broadened by linking up with initiatives such as Intelligent Energy Europe.

Outline of project requirements

- Ø The large-scale demonstration actions should focus on a **broad range of general lighting applications** (not "decoration projects") in order to facilitate SSL deployment at a European level.
- Ø **Reliable economic data** is needed which can only be derived from large scale demonstration actions.
- Ø The projects should **maximise impact and visibility to the European citizens**. A proper awareness campaign is considered as key.
- Ø A **set of several smaller demonstration projects** is preferred to a single large one.
- Ø **Network between these projects** will be necessary for broad awareness and maximum impact.
- Ø The demonstration projects should involve **all major players in the full value chain**, including end-users.
- Ø The demonstration projects should target the **refurbishment of existing infrastructure**, rather than installation in new buildings.
- Ø **Primary focus should be on commercial/non-residential sector** rather than domestic. This is because the impact of lighting on the energy bill is two times higher in the commercial than in the residential sector, and the commercial sector is much more driven by operating costs than the residential sector, which is more driven by initial acquisition cost.
- Ø Crucial that demonstration projects address the twin objectives of **BOTH improved energy efficiency AND better light quality**.

Benefits for Europe

- Demonstrate benefits and unique selling points of (O)LED lighting (latest state-of-the-art (including dynamics, controls, well-being aspects)) to convince customers of benefits, prove that it works, and build confidence. The **European citizens will benefit** from the advent of SSL technology; they will experience **more visual comfort at substantially less cost**.
- Realize **energy efficiency and meet 2020 targets**: SSL technology will largely contribute to the realization of the global sustainability targets. For the EU 0.6 PWh and 300 million tones of green house gas emission per annum can be saved by 2020. These numbers are projected to increase to 1.5 PWh and 750 million tones of CO₂ by 2050.
- The **competitiveness of the European lighting industry, employing 150,000 people today, will increase** due to the unique combination of photonics and lighting design knowledge. At present the European photonics industry is growing twice as fast as the world market. Europe is leading in lighting due to the design capabilities embedded in over 1000 luminaire and lighting design companies.

- The investment in intelligent SSL lighting solutions will result in **substantial savings to the European economy** which, no longer needed to pay our energy bill, can be invested in economic growth. The savings are estimated to equal 50 billion euro per year by 2020 and to reach 150 billion euro per year by 2050. (source: Report of the Consultation Group "Lighting & Photonic Technologies" of the Ad Hoc Advisory Group on ICT for Energy Efficiency, September 2008)

Balancing EU and private funding

The contribution of the EU funding to the large scale demonstration actions should be used to cover:

- the additional initial cost of an (O)LED lighting installation over a lighting installation based on proven technology,
- the validation of the energy savings and carbon footprint reduction realized,
- the dissemination of the project outcome beyond today's standard practice, involving installers, citizens and users.

Next steps

- Ø Dissemination to and interaction with players across the full value chain from end users through installers, designers and the SSL community via Photonics21 WG4 and bodies such as ELC, CELMA, AIE etc.
- Ø Drafting of the work programme description of the SSL actions for implementation in the CIP programme.

All presentations of this workshop and follow-up documents are to be posted in the Working Group 4 section within the member area of the Photonics21 website (www.photonics21.org). To register, visit <http://www.photonics21.org/MemberArea/register.php>

Acknowledgement

The Commission would like to warmly thank the rapporteurs of this workshop, Bruno Smets and Berit Wessler.

Annexes

Annex 1 – list of participants

Annex 2 – Photonics21 paper "*1st draft proposal on a European Solid State Lighting Initiative*"

Annex 3 – background document "*large scale demonstration action on SSL*"

Annex 4 – Report of the Consultation Group "Lighting & Photonic Technologies" of the Ad Hoc Advisory Group on ICT for Energy Efficiency, September 2008

Annex 1 – List of Participants

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