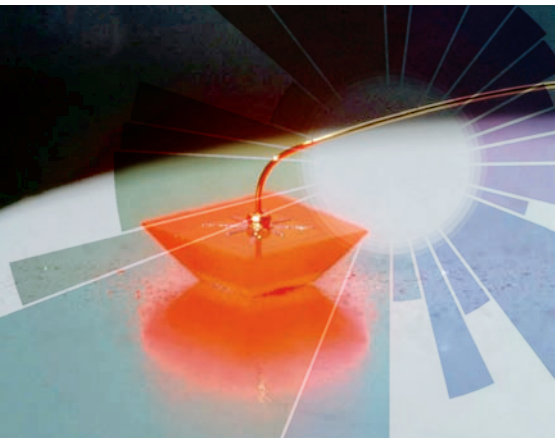
CALL 2010

Project profile

ENLIGHT

Energy efficient and intelligent lighting systems



The lighting industry is going through a radical transformation, driven by rapid progress in solid-state lighting and semiconductor technologies as well as by changing societal needs such as sustainability, improved energy efficiency and CO_2 reduction. Adaptation must be rapid in an open-innovation ecosystem driving R&D to serve the latest business requirements. The main goal of the ENIAC JU project EnLight is to exploit the full potential of solid-state lighting through breakthrough innovations in non-conventional, energy efficient and intelligent lighting systems, beyond retrofit applications.

Sub Programme

- Nanoelectronics for energy efficiency

The future lies in solid-state lighting (SSL) using light-emitting diodes (LEDs) for both professional and consumer needs, taking advantage of the intrinsic qualities of the technology, generating products that will open new perspectives for the creativity of the industrial designers.

This new technology landscape will create high value lighting systems and solutions by the seamless integration and combination of electronics allowing greater efficiency, lower cost, miniaturisation and new styling, while focusing on intelligence, interaction management and new non-lighting functionalities. Such approaches are key enablers of re-styling while from the technical viewpoint the application-driven systems benefit from green and sustainable solutions.

Complete value chain

The ENIAC JU project EnLight brings together a complete value chain including LED manufacturers, chip-makers, LED module manufacturers, luminaire and ceiling-fitting makers and even a large utility company. The consortium is particularly well-balanced including two of the largest European lighting industry players, prominent EU knowledge institutions and innovative small and medium-sized enterprises.

The needs and requirements of users will determine the business potential of the energy-saving options and functionalities while broad acceptance of SSL lighting systems will be assured through the proper evaluation of user case scenarios at the start of the project and real user validation at its end.

Major innovations will cover:

1. Solutions, with the focus on user needs and requirements of all stakeholders, ensuring full interoperability and integration. Mass-market acceptance within a few years is the main driver. This will enable the introduction of intelligent LED control systems using energy-efficient dimming and fast switching capabilities;

2. Systems, with an emphasis on integration, interoperability and cost control compensating the increased complexity. This will cover reliable task and activity sensors, algorithms, robust architecture and interfaces for smart lighting systems. It will also include future, non-conventional luminaires which are not limited by retrofit solution constraints; and
3. Components, with a focus on optimal use and integration of LEDs, optics, heat management, electronics and controls in modules to achieve energy-efficient LED drivers and modules.

The technology evolution

Within the first SSL transition wave, traditional lamps in existing luminaires will be replaced by LED retrofit systems. This means new LED light sources have to be mechanically, electrically and thermally compatible with the installed base of previous generation lamps and controls. This transition has already started.

As the first wave of new LED systems have the same form factor as incandescent lamps, they will have limited performance and reliability caused by compromises in the interfaces for heat, optics and electronics. EnLight will develop more compact and efficient lighting electronics, drivers and controls, leading to optimal LED modules.

In the second wave, SSL products will no longer be limited by a legacy infrastructure. This means existing fixtures, optics and luminaires will be redesigned and optimised for SSL sources with new mechanical, optical, electrical and communication interfaces and some degree of standardisation. Here EnLight will develop SSL solutions in free form factors, maximising the impact of SSL technology to improve efficiency and lower the overall systems costs.

A third wave will be created building upon the intrinsically digital nature of SSL. LEDs are based on semiconductor technology and are therefore easier to combine with control systems. With a smart combination of novel sensors, controls and optimal LED drivers, standardised smart lighting solutions could be created, which are easy to apply, install and maintain. In this case, EnLight will develop the optimum intelligent SSL system with maximum efficiency for easier market acceptance, by working together with ceiling-fitting and control suppliers.

Ensuring a bright future

The future of both domestic and professional lighting is in the application of LEDs, taking advantage of the technology's intrinsic qualities. This will lead to products that inspire designers and enable lighting to develop in ways conventional systems could never do. By building on Europe's global leadership in both semiconductor manufacturer and in lighting, EnLight will ensure that this sector has a bright future.

Energy efficiency

Partners:
- Applied Micro Electronics
- ART
- Besi-Fico
- BJB
- CEA-LETI
- Delft University of Technology
- Eagle Vision
- Eindhoven University of Technology
- Enel
- Fraunhofer
- Helvar
- Infineon Technologies
- I-NRG
- Insta Elektro
- Legrand France
- NXP Semiconductors France
- NXP Semiconductors GA
- Osram
- Philips Electronics Netherlands
- Philips Lighting
- PKC Electronics
- Plugwise
- Rockwool France
- RWTH Aachen University
- There Corporation
- Netherlands Organisation for Applied Scientific Research (TNO)
- University of Perugia
- Uppsala University
- Valopaa
- VTT

Project co-ordinator:
- Frank van Tuijl, Philips Lighting

Key project dates:
- Start: April 2011
- Finish: March 2014

Countries involved:
- Finland
- France
- Germany
- Italy
- The Netherlands
- Sweden

Total budget:
- €41.3 million

Details correct at time of print but subject to possible change. Updates will be included in the project summary at the end of the project.

The ENIAC Joint Undertaking, set up in February 2008, co-ordinates European nanoelectronics research activities through competitive calls for proposals. It takes public-private partnerships to the next level, bringing together the ENIAC member states, the European Commission and AENEAS, the association of R&D actors in this field, to foster growth and reinforce sustainable European competitiveness.

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