

SUSLIGHT: SUSTAINABLE LED LIGHTING – TECHNOLOGICAL CHALLENGES, BARRIERS TO MARKET ENTRY AND POLITICAL ACCEPTANCE

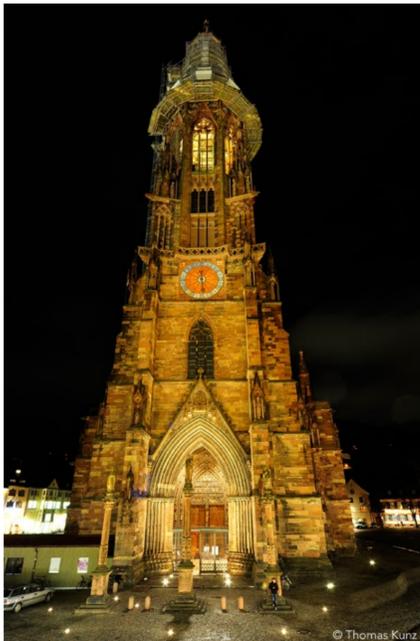


Figure 1: Illumination of the Freiburg Minster with LEDs.

The efficient use of energy is essential for a sustainable development of our society. Approximately 20 percent of the generated electricity world-wide is being used for lighting purposes. With the development of the white light-emitting diode (LED), a highly efficient and long-lasting light source has emerged in the scope of continuous technological progress: it allows an energy-saving level of up to 85 percent compared to classical light sources such as light bulbs.

Currently, several barriers still impede the wide-spread use of LED-lighting. First of all, the production costs of LEDs are still

quite high, thus resulting in a considerably high purchase price for LED light sources. Even more significant is the purchase price for LED system luminaires, which are adapted to the special technical features of LEDs, as they allow to fully exploit the energy-saving potential of LEDs as well as their additional functionalities. Furthermore, it is not only necessary to provide inexpensive and long-lasting LEDs, but also the required operating and driver electronics.



Figure 2: LED retrofit lamp as alternative to classical light bulbs. Left: LED retrofit lamp with an energy-efficient driver based on gallium nitride, developed at Fraunhofer IAF.



In order to foster the wide-spread acceptance and acknowledgement of LED lighting and to achieve an increased LED-market share, the pilot project “SusLight” combines technical competencies with economic and behaviorist findings in an interdisciplinary approach. The **Fraunhofer Institute for Applied Solid State Physics IAF** and the **Fritz Huettinger Chair of Microelectronics of the Department of Microsystems Engineering (IMTEK) of the University of Freiburg** develop efficient and temperature-resistant LED modules, efficient LED-drivers, as well as a LED system luminaires for network operation. In the field of Smart Lighting, the project partner **Hahn-Schickard** works on the integration of smart sensing and information technology systems for the intelligent control of LEDs in accordance with human or environmental requirements.

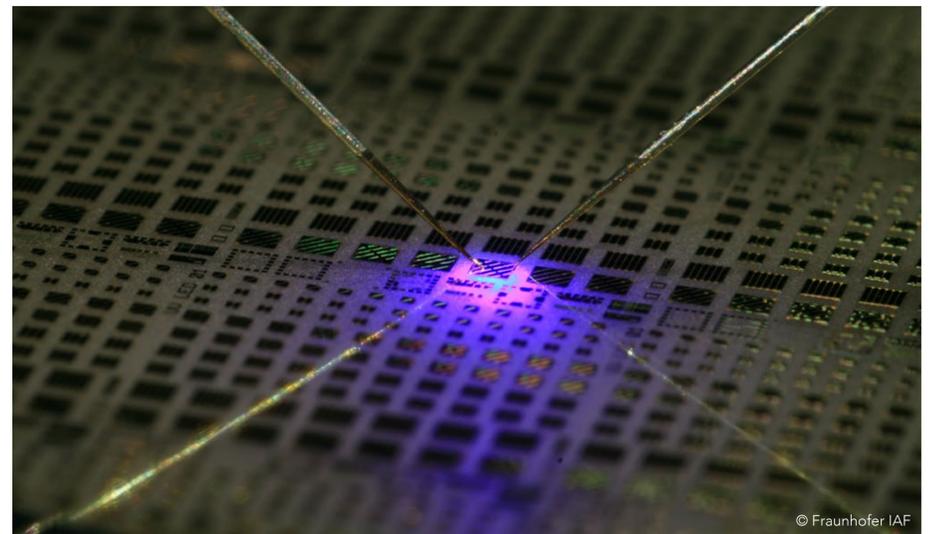


Figure 3: Testing of LEDs of different sizes on an LED-wafer.

To promote the target-group oriented marketing of LED light sources, the technological developments of the project are supplemented through the research on consumer decisions and cost structures, conducted by the **Institute for Economic Theory and Financial Sciences**. The Business Seminar contributes with findings on consumers’ acceptance of LED light sources, based on behaviorist market research concepts and methods. In addition, the **Department of Economic Policy and Constitutional Economic Theory at the Institute for General Economic Research** analyzes the political potential of the technological transition and investigates the success of different economic policymaking strategies for the sustainable market introduction of LED system luminaires.

In cooperation with:



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