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ILLUMINATING THE FUTURE: SMART LIGHTING AND PROGNOSTICS HEALTH MANAGEMENT (PHM)

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 Enhancing Safety, Efficiency, Availability, and Effectiveness of
 Systems through PHM Technology and Application

Illuminating the Future: Smart Lighting and Prognostics Health management (PHM)



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1


Vision, Structure, and Alignment

Smart Lighting fits perfectly with the IEEE mission for Advancing Technology for Humanity because artificial light generation is an inherent need of human beings and society.	The Lighting Industry and ICT Industry are now rapidly evolving and converging. IEEE should accompany this evolution.
Lighting consumes huge amounts of energy and resources; it impacts our performance, security, well-being and health, but also our environment and ecosystem.	Lighting is a factor of sustainable development.





Objective:
 Cluster IEEE member's expertise from various horizons and disciplines along with external resources (academia, industry, governments, etc.) to build a community for advancing the knowledge in Sustainable Smart Lighting Systems (SL) serving to better humanity.



2

FDC Project Report

2

By the way what is “Sustainable Smart Lighting” ?

A *smart lighting system’s* principal function is to **produce, at any moment, the right light** where it is needed and when it is necessary.

It should **adapt the quantity and quality of light** to enhance visual performance in agreement with the type of executed tasks.

It must **guarantee well-being, health and safety** of the end-users.

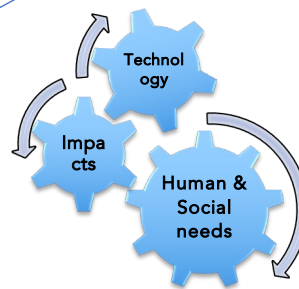
It should **not squander passively the resources** of our planet and **limit actively the effects of light pollution on the biotope** and other impacts on the environment.

A such system could provide **additional services** (geo-localisation, connectivity...) to the end-users through **Visible Light Communication protocols**.

The SSL² concept:

A **Sustainable Smart Lighting (SSL)** system uses and optimizes to an intelligent way the best existing technology for **State Lighting – SSL** to best fulfil present needs for artificial light and reduce undesirable effects, without compromising the ability of future generations to innovate.

Reliability is a cornerstone element



Light-up smart, to a sustainable & affordable way, where it is needed, when it is necessary and as best as possible!

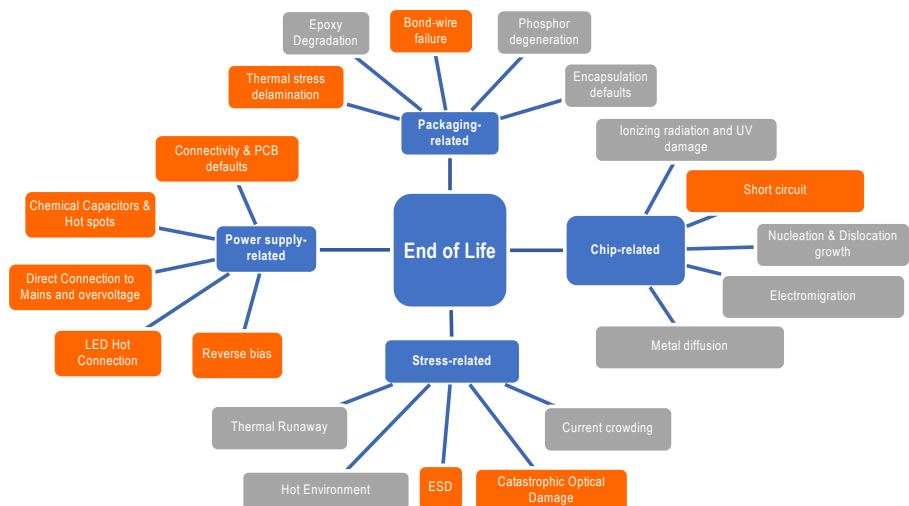


3

3

SSL Failure mechanisms

Light Emitting Diodes



- Catastrophic
- Parametric



4

4

Maybe other parameters have to be included...

The Color Shift exemple...

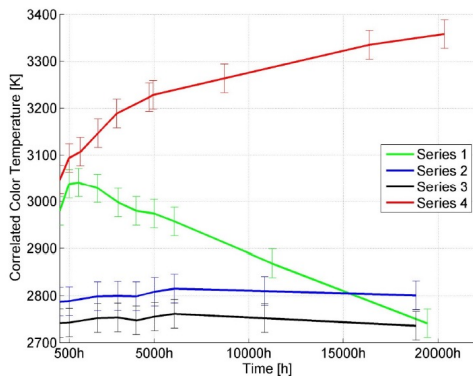
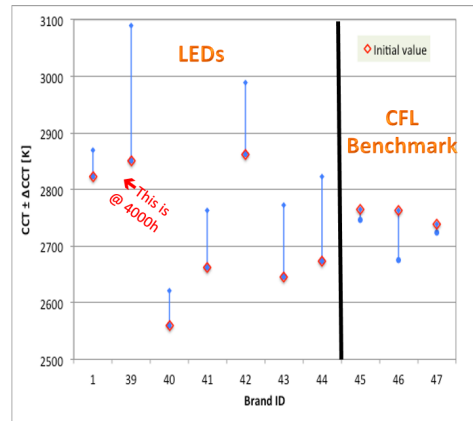
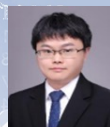


Figure 5 - The correlated colour temperature vs. time for the 4 lamp series

CCT shifts @ 6000 h



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