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

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2024 IEEE International Conference on Prognostics and Health Management  
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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## Vision, Structure, and Alignment

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



**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



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## 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.

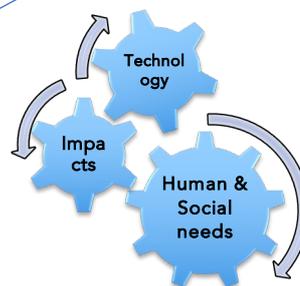
It should **not squander passively the resources** of our planet and **limit actively the effects of light pollution on the biotope** and other impacts on the environment.

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

### The SSL<sup>2</sup> 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!

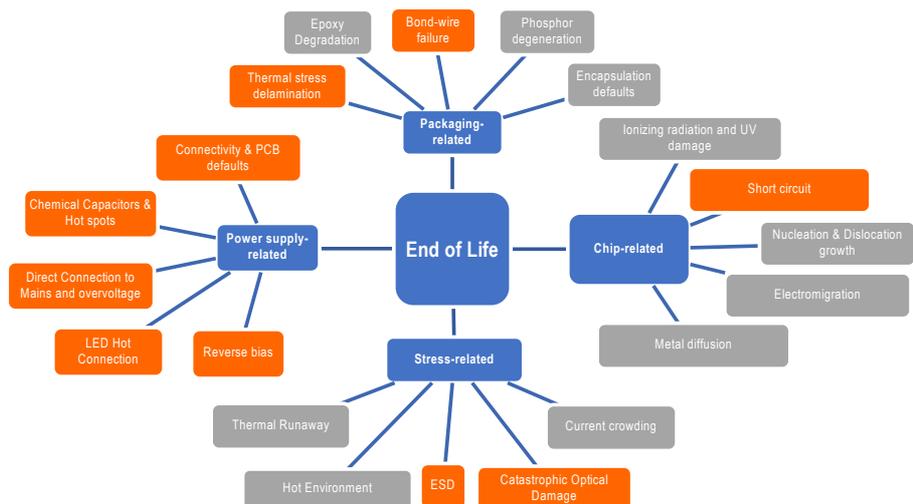


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## SSL Failure mechanisms

### Light Emitting Diodes



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## Maybe other parameters have to be included...

The Color Shift exemple...

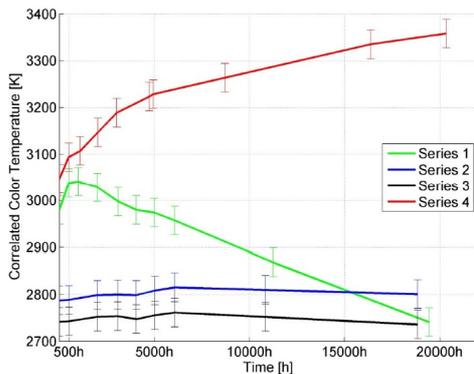
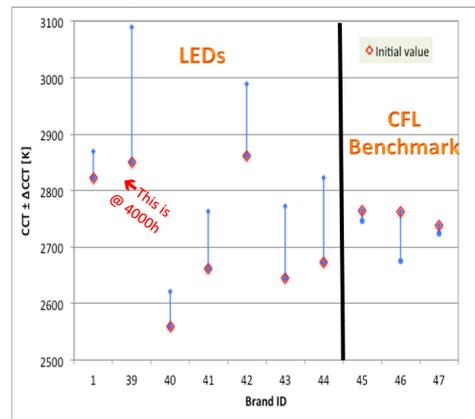


Figure 5 - The correlated colour temperature vs. time for the 4 lamp series

CCT shifts @ 6000 h



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