

# Toward to “Lighting 4.0” era – The “Right Smart Lighting” Challenge as prime contributor to World’s Sustainable Development goals

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## **Abstract:**

During the last decade, SSLs-Solid-State Lighting based on components like LEDs, OLEDs and LDs, challenges conventional technologies. In particular, LED has turned into a game changer beating the conventional technologies in all aspects. It is therefore anticipated that in short term, all of electric lighting will be based on SSLs. Today, SSLs proceed to the projected conclusion: replacing all legacy technologies, this is a major change in the lighting market that is considered as a revolution.

Artificial light production absorbs around 2 900 TWh corresponding 16,5% of the world’s electricity annual production. Historically speaking, past century’s research and development focused on single energy efficacy enhancement. During the last decade, Solid-State Lighting (SSL) based on components like LEDs, OLEDs and LDs, challenges conventional technologies. In particular, LED has turned into a game changer beating the conventional technologies in all aspects. It is therefore anticipated that in short term, all of electric lighting will be based on SSLs. That way, SSLs proceed to the projected conclusion: replacing all legacy technologies, this is a major change in the lighting market that is considered as a revolution.

The only massive adoption of SSLs during the next years can contribute to harness electricity use for lighting, up to 4% by 2030. However, as SSL technology matures, maximizing the energy savings from connected SSL systems will become increasingly dependent on successful integration into the built environment. Today, we are witnessing a transition from the conventional “analogue” lighting technologies to “digital” lighting. Intelligent lighting will become the backbone for smart homes and smart cities. This way, lighting will become the heart of the “Internet of Things”. Consequently, we knowingly were not serving society as effectively as we could. Industry has coined a new term “human-centric lighting” (HCL) to draw renewed attention to its primary effort to be successful in meeting society’s needs.

Las but not least, “rebound effect”, known also as “Jevons paradox”, can seriously blur this march forward. One potential solution to avoid that negative effect consists on switching to smart human-centric lighting driven by both “application efficiency” and quality of light. This just means that next gen lighting systems should provide the “Right Light” with the best efficiency and quality, when and where it is needed.

This keynote lecture will highlight all the above-mentioned issues and will focus on the future of the lighting systems and their contribution to sustainable development of our world.