Replaceable linear LED light sources - solutions for future-proof and serviceable luminaires

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Sustainable Lighting for Smart Cities and Buildings

Michael Huelskemper

ams OSRAM

…and the winner is?

Since 2010 LEDs entered the general lighting market with impressive speed thanks to advantages vs. traditional light source

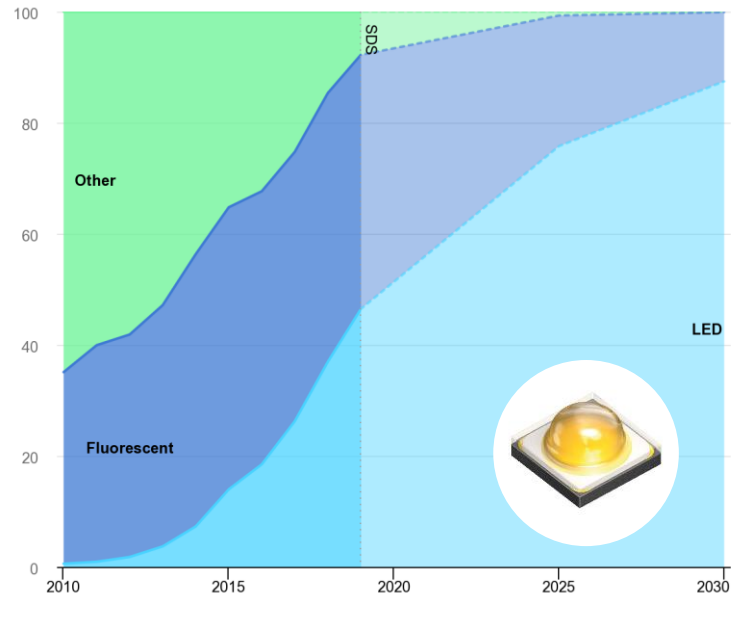
- Significant energy savings
- Intrinsic long lifetime
- Lower cost LED luminaire designs

Win-win-win? YES!

No “But…”?

Highly optimized LED luminaire designs not designed for

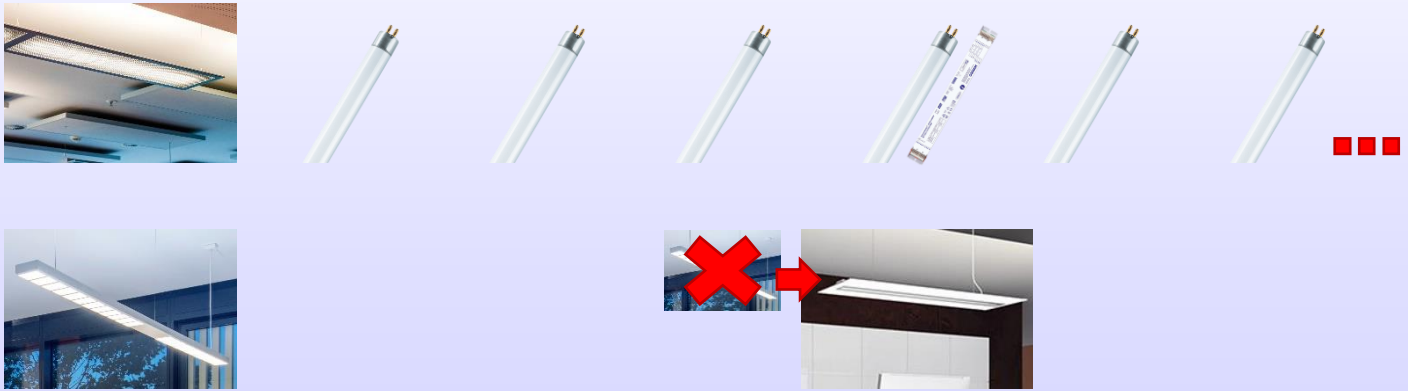
- servicing (on component level)
- upgrading



Sources: Lighting sales by type in the Sustainable Development Scenario, 2010-2030, iea.org 2020 (chart); OSRAM (picture)

Luminaire lifecycle comparison

Traditional concept supports long-term luminaire use thanks to standardized light source system



Source: OSRAM

time

Traditional:
Multiple re-lamping cycles possible

LED:
LED EoL = Luminaire to be replaced

Standardization enabling interoperability and serviceability

Example Standardized lamp/ECG system

- Standardized mechanical/electrical interface (G13, E27, MR16…)
- Standardized lengths
- Multiple versions (HO, HE, CCT, CRI…) from different vendors

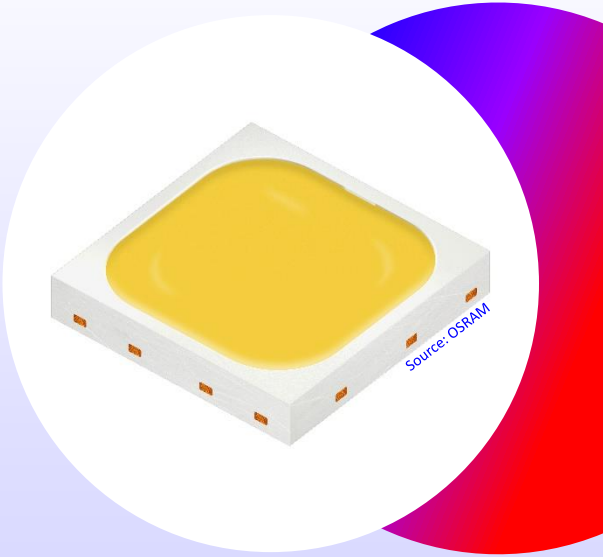
Interoperability
Different products from multiple vendors can be combined

Serviceability
Easy and safe maintenance (ubiquitous availability)

Suitable for the LED world?

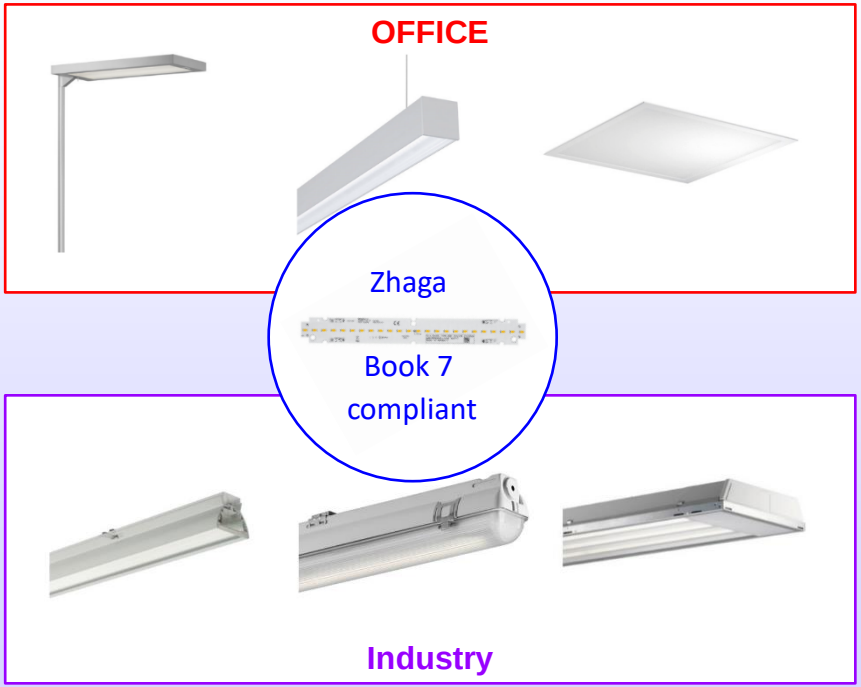
Objective for sustainable LED lighting system

- A plug-and-play, cost-effective, future-proof and reliable solution enabling end-users to replace interoperable modules to preserve the luminaire value.
- The system should allow for sufficient flexibility for components and luminaires.



Where to start?

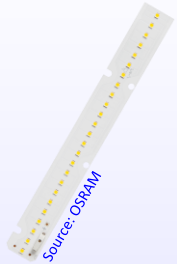
LED Linear modules for general lighting applications



Source: OSRAM

- Linear LED modules reached a high level of similarity already.
- Zhaga Books secure mechanical fit of LED modules of different vendors
- Blocking points for interoperability and serviceability lack of standardization on
  - Flux
  - Efficiency
  - Operation point (voltage / current / temperature)
  - Electrical interface

Replaceable LED Linear Light Module System Comparison



- LED Linear Retrofit Lamp

Advantages

- Known form factor & handling
- Known fixation and connection system
- Retro-fitting installed luminaire base

Proven solution but not efficient due to legacy properties
Not designed for LED technology!

- LED Linear Module

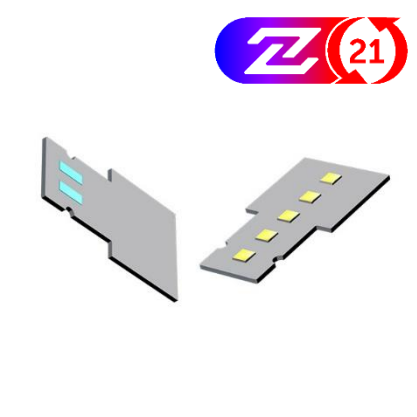
Advantages

- High Efficiency
- High optical flexibility
- High luminaire design flexibility (low profile)
- Less (qty. and div.) materials used
- Lower cost spare part

New concept but more potential and sustainable

Zhaga standardization on replaceable and interchangeable linear LED modules

Two Books in progress to address the different LED luminaire architectures



Book 21

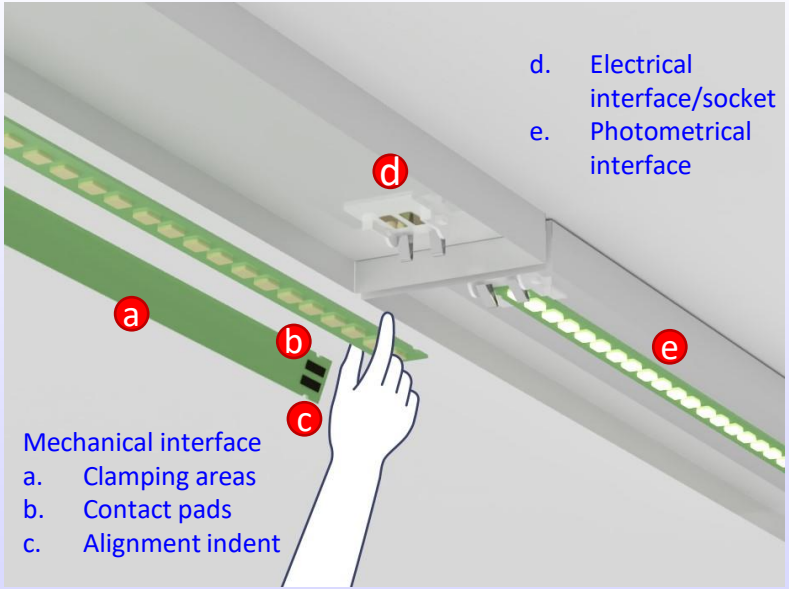
Linear socketable LED modules for SELV applications

Book 26

Linear socketable LED modules for non-SELV applications

Both books will share high similarity with respect to mechanics, thermal and optical requirements

Replaceable and interchangeable linear LED modules (example Zhaga Book21)



Key Features and Benefits

- Safe and easy toolless replaceability
- Plug and play interoperability
- Supporting circular economy and upgradeability
- Enabling seamless lighting lines
- Portfolio:
  - 2 lumen packages
  - 3 lengths (1, 2, 4 ft)
- Cost effective

Zhaga replaceable and interchangeable linear LED modules Book21 & Book26

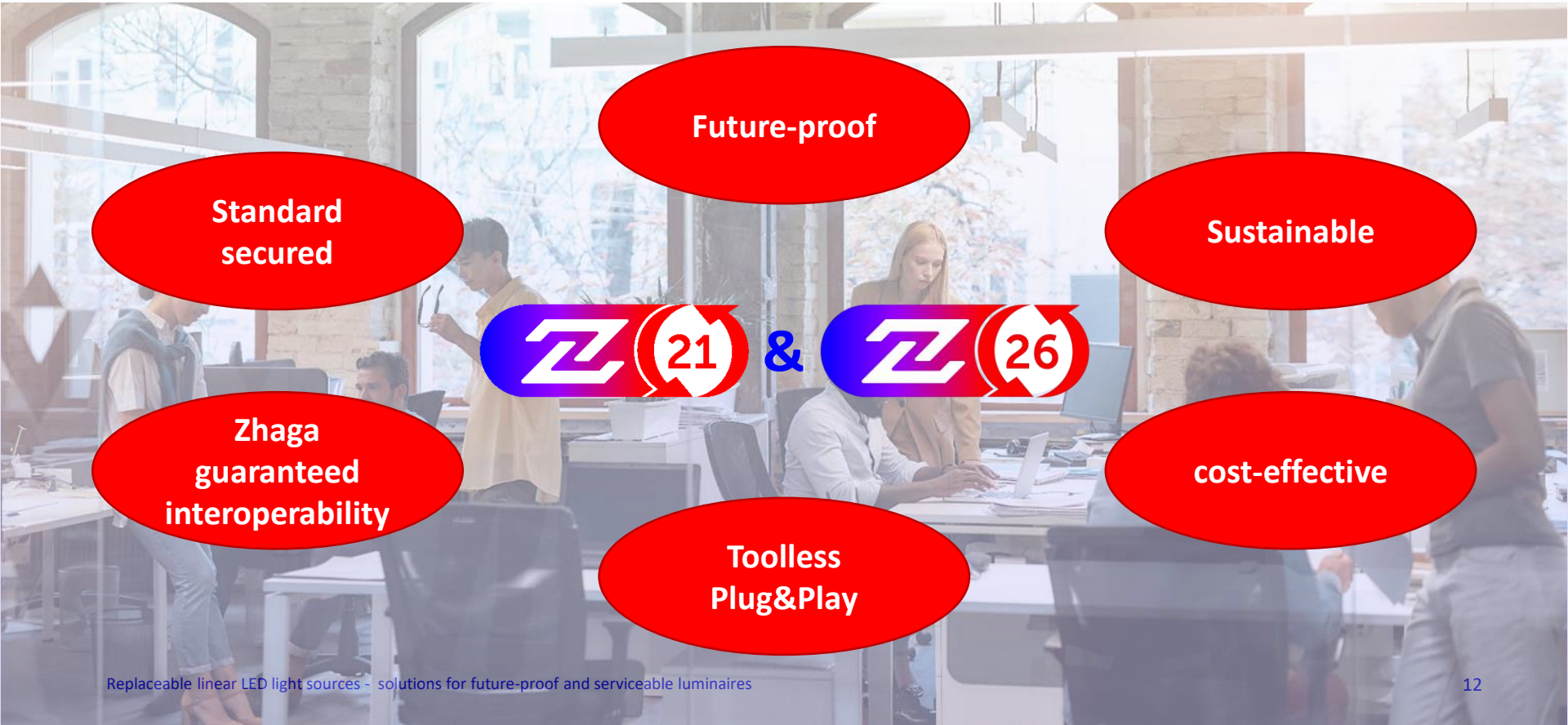
Scope

- First step towards interoperable LED luminaire components to enable serviceability
- Targeting mass-market of linear luminaires (batten, waterproof, troffer)
- Simplifying luminaire design, approbation and configuration

System

- System components featuring Zhaga Book21 or 26 logo for identification
- Wide variety of products by different vendors
- Safe replacement by electricians, facility managers or other qualified persons in the application
- Longer luminaire use thanks to upgradeability

Zhaga Book21 & 26 enabling Circularity Lighting



Thank you

For further information, please contact

Dee Denteneer, Secretary General,
secgen@zhagastandard.org

Axel Baschnagel, Marketing Communications,
marcom@zhagastandard.org

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