

SILICA - The Engineers of Distribution.

LED Evenement 2013

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LED Modules In The World Of General Lighting

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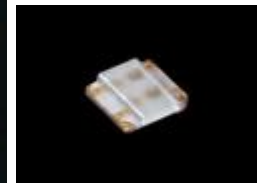
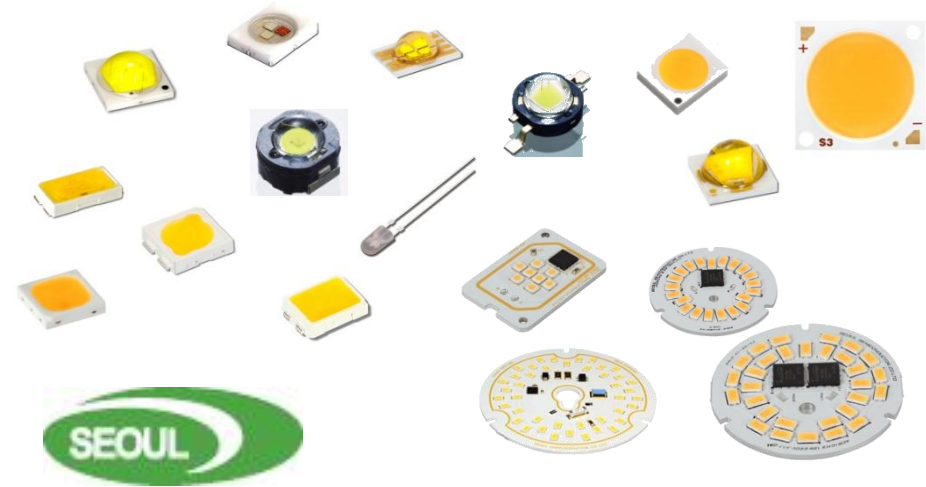
Facts & Figures – SILICA at a Glance



- Established 2001
- Headquarter in Poing (Munich)
- € 972M
Net Sales FY13
- 625 Employees
- 110 FAEs
- 39 Offices
- 20 Countries
- 25 Franchises
- 15.000 Customers

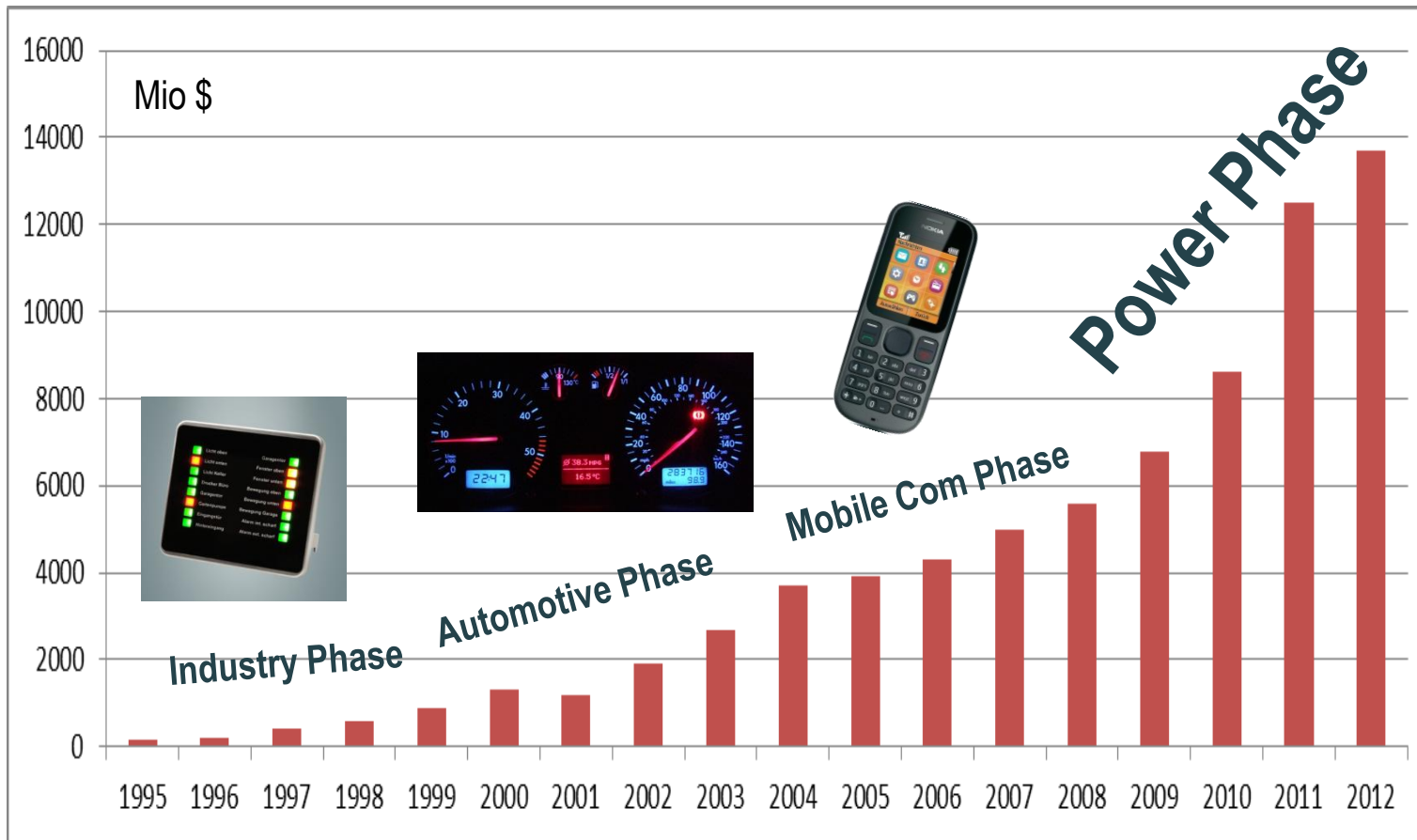


Independence delivers best choice for the customers' applications



The Global LED Component Market

Each phase had a major market segment as a growth driver

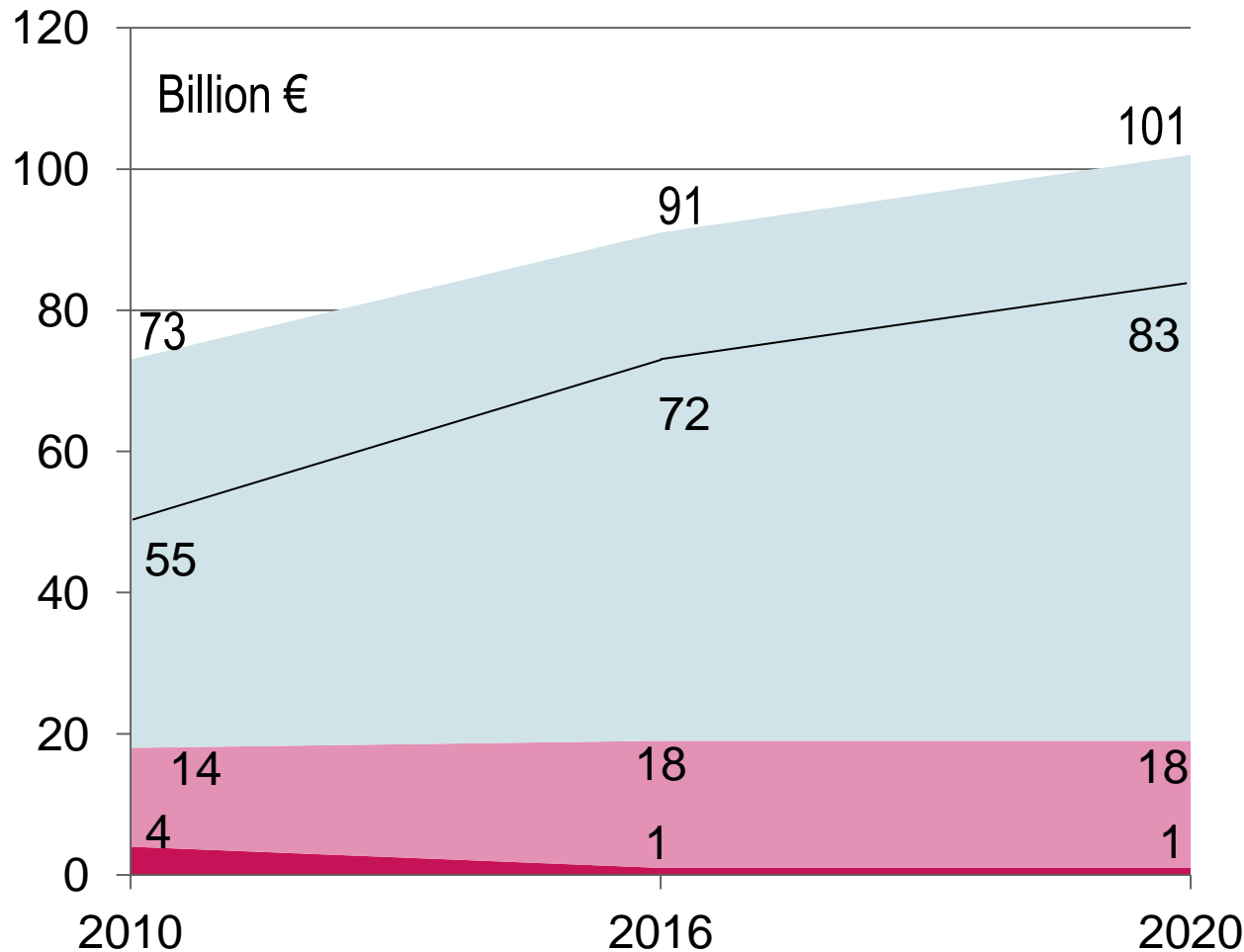


Source: Strategies Unlimited



The Global Lighting Market Trend By Sector

Global lighting market size is expected to exceed 100 billion € in 2020



**Biggest CAGR
for General
Lighting within
the entire time
periode**

2011-16 6%

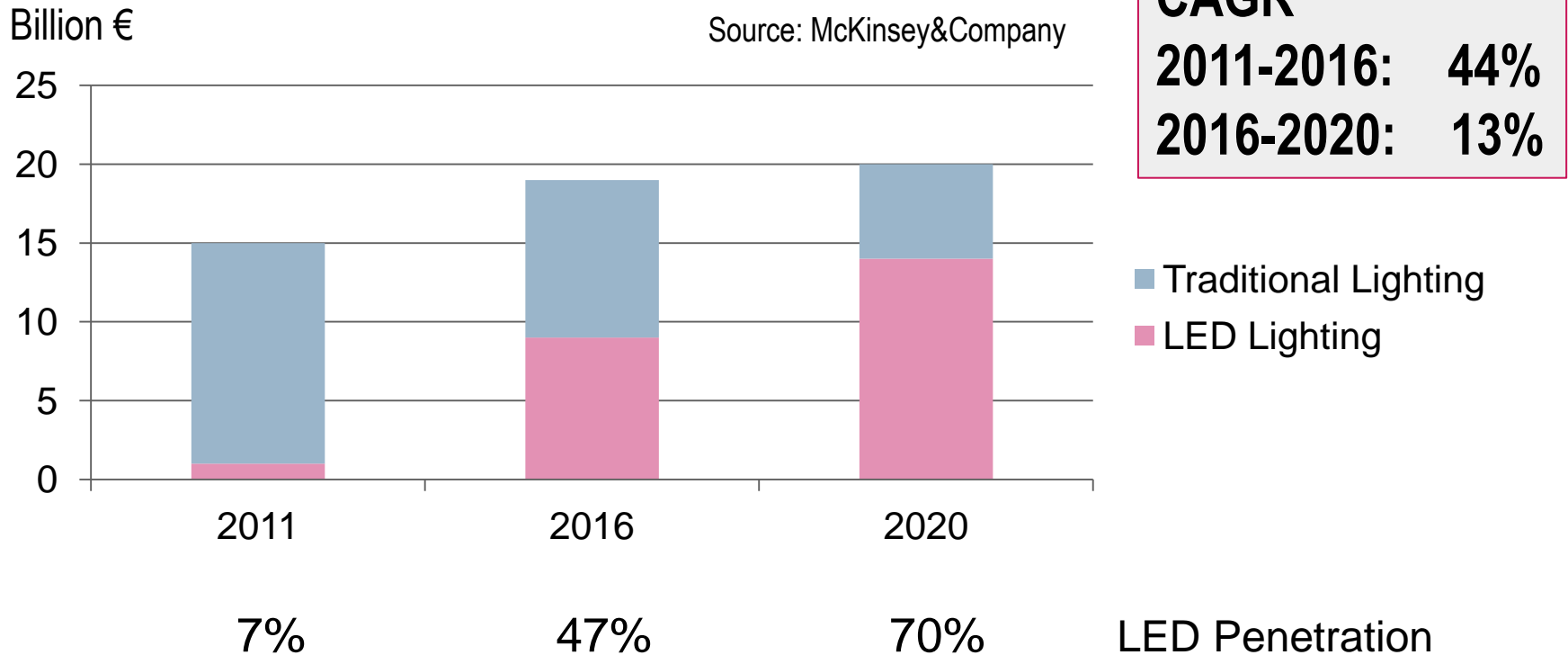
2016-20 3%

- General Lighting
- Automotive Lighting
- Backlighting

Source: McKinsey&Company

The General Lighting Market For Europe

Including full value chain



General Lighting offers biggest growth potentials for LED products in near future.

Technology Transition In The Lighting Market

Traditional lamp technologies migrate to LED Semiconductor technology

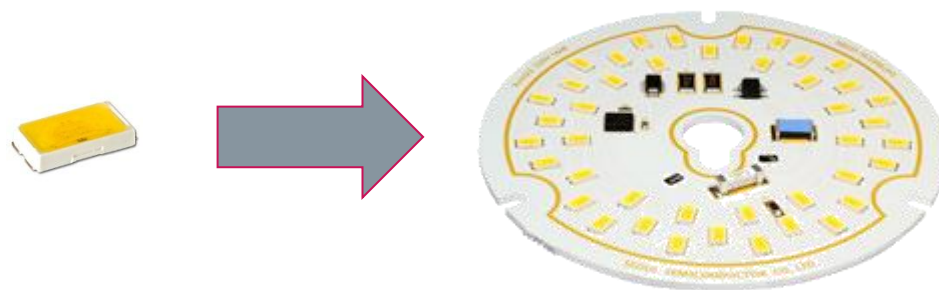
- Longer lifetime of LEDs
- Total cost of ownership (TCO) pays off now
- More design flexibility with LEDs
- Easier control of lighting
 - Physiological influence (CCT control)
 - Energy saving (presence detection)
 - Web based light controls
- Legislation drives reduction of energy consumption
 - Tungsten lamp got banned in the EC from 2009 – 2012
 - Halogen lamp will get banned in 2016
 - Fluorescent lamps and HID lamps contain mercury



The Need for LED Modules in General Lighting

Luminaire makers want to get modules

- Various design competencies are necessary to develop LED based lighting products (thermal, optical, electrical and mechanical design)
 - ➔ Not every luminaire maker can afford to maintain all of these areas of expertise
- The fast evolving LED Technology requires continuous redesigns in short innovation cycles
 - ➔ Continuous development and tooling costs impact the profitability of any luminaire
- Continuous price erosion of LEDs makes stock-keeping difficult
 - ➔ Capital commitments influence the product profitability



“Zhaga” Defines Standard Modules

With Clear Customer Benefits

- Zhaga is a global consortium of industry players that creates standardized interfaces for LED Light Engines to secure a stable design platform for luminaire designers and manufacturers
- Zhaga is an industry-wide co-operation with more than 250 member companies:
 - Luminaire makers and LED Light Engine manufactures
 - Component suppliers for heat sinks, optics, connectors, ...



www.zhagastandard.org

Customers' benefits:

- Broad supplier base for same type of module
- Long term supply of modules → Module = Lamp
- Reduced R&D cost and less capital commitments



The Zhaga Interface Specifications

For General Lighting Products

Book 1: General

- Definitions
- Principles
- ECG dimensions

Book 2: Socketable LLE with integrated ECG (65 mm base)

Light Emitting Surface
59mm round



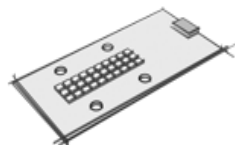
Book 3: Point Source LLE with separated ECG

Light Emitting Surface
9mm – 23mm round



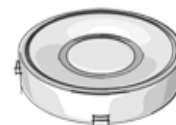
Book 4: High Intensity Engine with separate ECG

Light Emitting Surface
Rectangular
30 mm x 7,5 mm
42 mm x 10,5 mm
60 mm x 15 mm



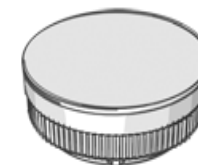
Book 5: Socketable LLE with separate ECG

Light Emitting Surface
9mm – 23mm round



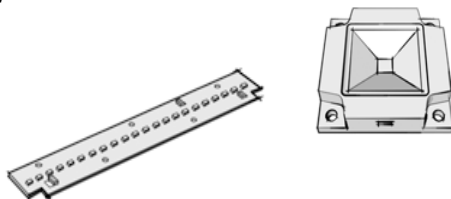
Book 6: Socketable LLE with integrated ECG

Light Emitting Surface
92mm round



Book 7: Office LLE with separate ECG

Mechanical dimensions
Rectangular
L6W6
L28W2
L28W4
L28W6



Book 8: Socketable LLE with integrated ECG – (85 mm base)

Light Emitting Surface
59mm round



Zhaga certified luminaires, light engines, modules, control gear, lamp holder



Philips, Tridonic, Osram GmbH,
Cooper Lighting, BJB GmbH&CoKG,
USAI Lighting, RSA Cooper Lighting,
Vossloh Schwabe, Lustrous, Ideal,
iGuzzini, Megaman, A.A.G. Stucchi, ...

There Is All Kinds Of LED Modules

A Google search for „LED module“ delivers an endless variation

LED Modules differ in:

- Size
- Shape
- Light color
- Radiation angle
- Luminous flux
- Color temperature
- Color rendering index
- Driving conditions
- Power consumption
- Materials
- And so on...

LED Users love to match the LED Module to their application requirements.



Customized vs. Standardized Modules

Advantages and benefits of customized modules vs. standardized modules (e.g. Zhaga)

Customized Modules	Standardized Modules
<ul style="list-style-type: none">• Differentiation from competition• FFF (Form Follows Function)• Styling and design	<ul style="list-style-type: none">• Long term product supply• Broad supplier base (price!)• Reduced R&D and tooling cost• Reduced capital commitments• Shorter time to market

- The lighting market will need both type of modules
- The majority might use standard modules due to cost pressure in future
- For cost driven products it makes perfectly sense to match the lighting application to existing low cost LED Modules !!!

THANK YOU

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