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Global LED Market Overview and Forecast

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Chairman

Global Lighting Forum

Vice-President Philips Lighting
- Head of sustainability, government and industry affairs and standardization
President European Lamp Company federation (since 2001)

Taiwan International Lighting Show – International Forum

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Solid State Lighting Benefits: 8 Dimensions of Opportunities

- Energy Efficiency
- Business Opportunity and Business Models

LED technology offers many new opportunities

- True Lighting Systems
- Environmental Protection
- Biological Effectiveness
- Product Safety
- Unequaled Design Freedom
- Assured Quality

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The Energy Dimension

- Lighting is responsible for 18% of all electricity consumption in the built environment
- According to estimations made by DoE in the USA annual energy savings from solid-state lighting will be approximately 190 TWh
- This switch to LED can replace 24 (1.000 MW) power plants
- These savings would reduce greenhouse gas emissions by 31.4 million metric tons of carbon
- Total electricity consumption for lighting would decrease by roughly 25 percent (with an assumed market penetration of SSL <50%) relative to a scenario with no solid-state lighting in the market

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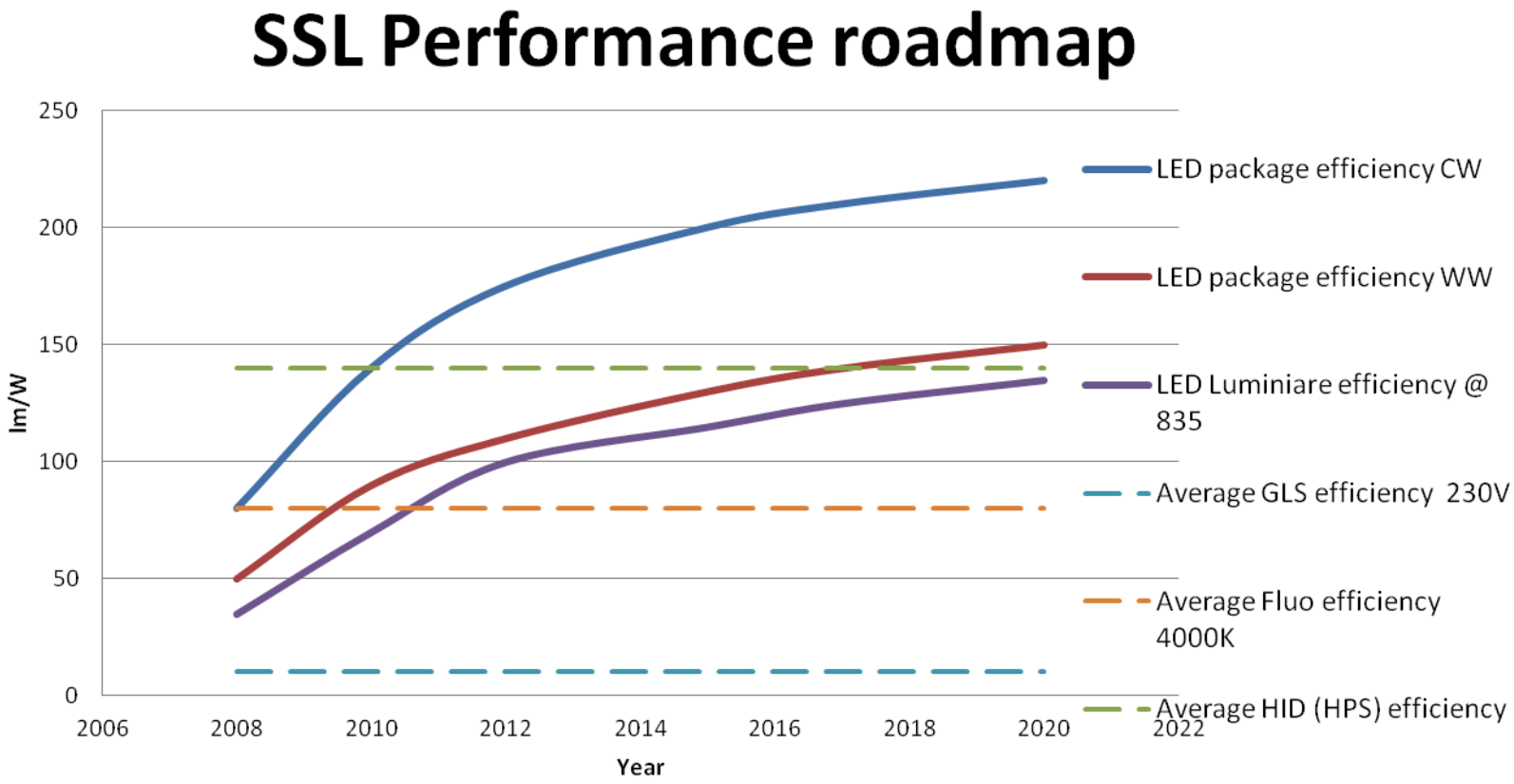
The Energy Dimension



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The System Dimension

- New (**ICT) opportunities** will result from a integrated systems approach.
- The use of **controls** like presence detection, daylight control etc. will be key to further reduce energy consumption but will also be applicable to the automation and cooperation of any system in relation to SSL lighting.
- Extension of **communication** and interaction between various control systems for improving or optimizing light quality thereby enhancing peoples life's in domestic, public as well as in road lighting (safety).
- **Innovation** platforms, standardization & new protocols will lead to high level **employment** & jobs in the industry.

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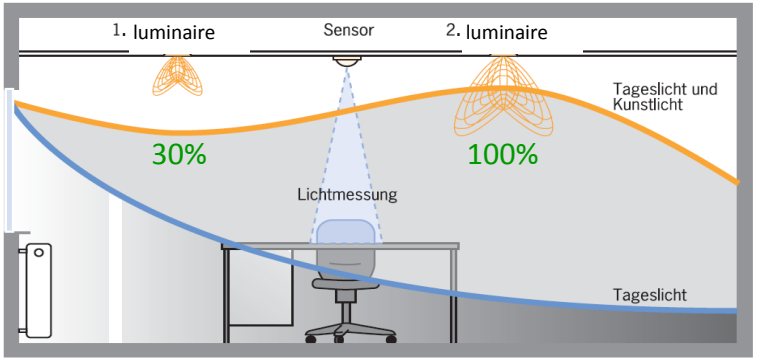
The System Dimension

Lighting controls seems to be in the same condition as electronic ballasts one decade ago…

… LED Solutions will be complimentary and value adding to this !

	Saving potential	Penetration indoor
Permanent (on-off)	0 %	**97 %**
Daylight linking	20-40 %	**< 8 %**
Presence detection	15-30 %	**< 8 %**
Time management	5-15 %	**< 4 %**
Constant illuminance level	10-25 %	**< 3 %**



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The Environmental Dimension

- LEDs do not emit UV and less IR Radiation
- LEDs do protect biodiversity better than other lighting solutions
- LEDs do create less spill light
- LED do save materials

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The Biological Dimension

- **Biological effective lighting** is based on a recently identified receptor system in the human eye and its corresponding nervous pathway to the brain. Influencing our hormonal system and sleep/wake cycle, alertness, cognition and in the end our **well being and health.**

- Artificial LED light optimized for the application can provide for better work & living conditions esp. for elderly people. It can also contribute to higher productivity at work places and educational facilities With these benefits, LED technology can strongly contribute to **manage demographic change**

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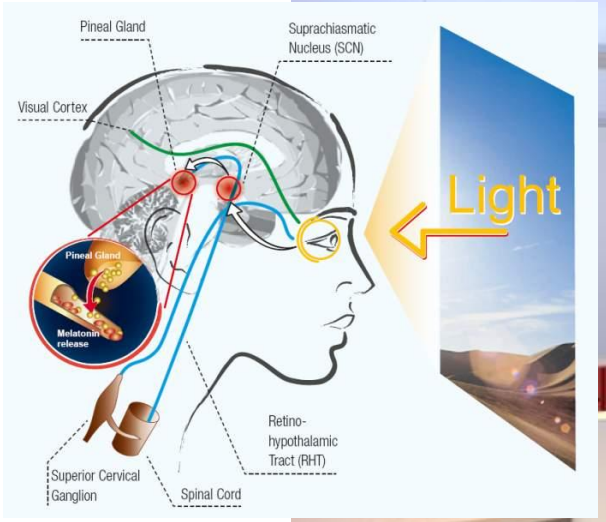
The Biological Dimension



- Wide distribution of light at ceiling and upper walls to effectively stimulate many receptor cells
- Use cool white and blue LEDs

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The Safety Dimension

- Cold Technology – minimizes the risk of fires in homes
- Less maintainance - safer workplaces
- Better CRI for white LED street lighting provides better visual situation especially while driving

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The Design Dimension

- Almost unlimited possibilities for creative lighting design
- Enhancing the feeling of safety in the built environment
- Redefine and re-invent lighting
- Make techno-aesthetics happen

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The Design Dimension

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The Quality Dimension

- New standards should ensure that new LED products will be of high quality
- Bridge the gap between expectations and the reality
- Good quality and high consumers' acceptance is the basis to achieve all dimensions of benefits
- Analysis of what really causes disappointment, counter with position of stringent premature failure rate

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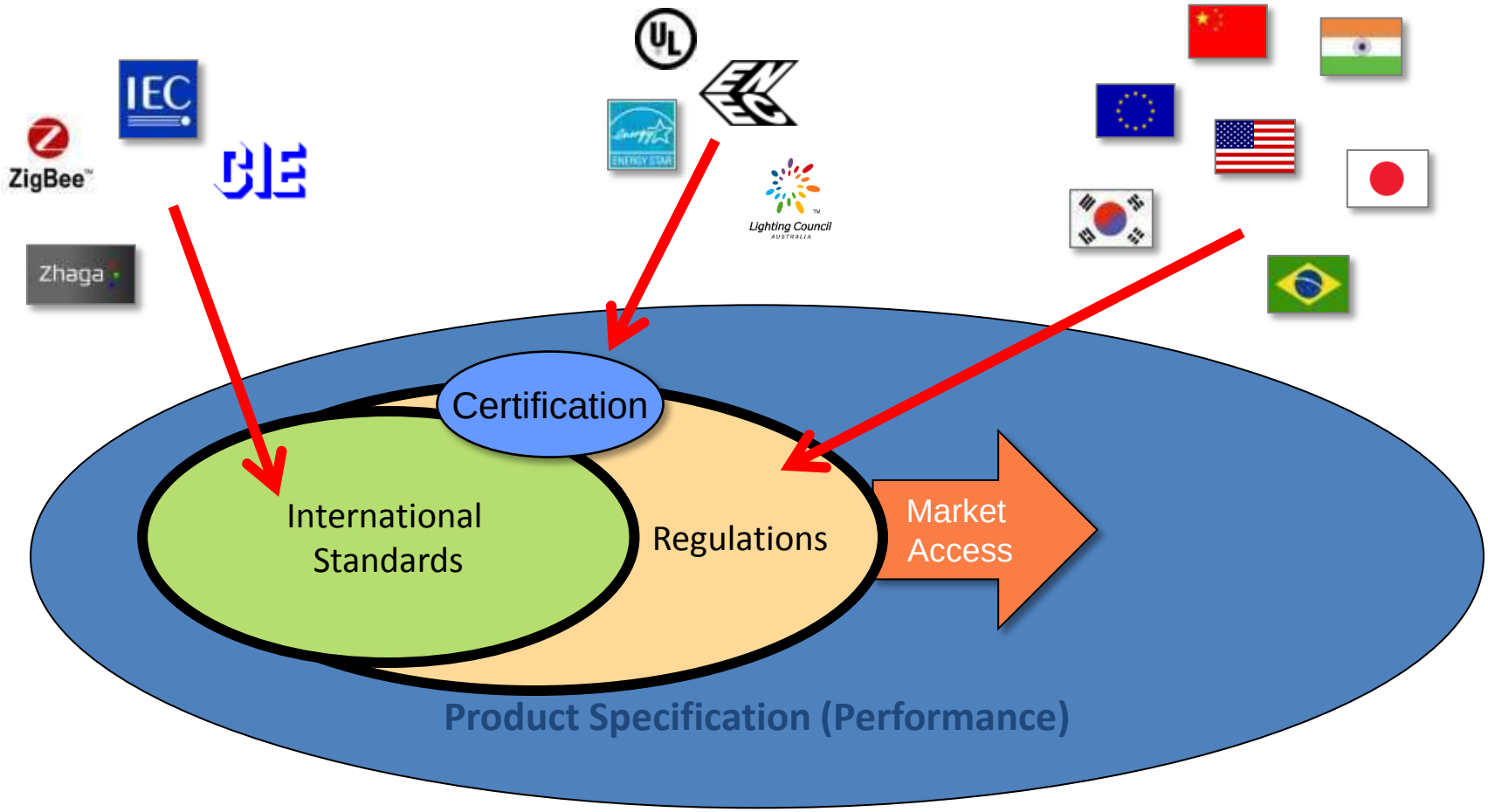
The Quality Dimension: Standards and Regulations



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The Business Dimension

- The characteristics & benefits of LED lighting technology will lead to a **change in business models** in lighting.
- Lighting Services are expected to become highly value adding, leading to the need to deliver horizontally integrated solutions
- From recurrent revenues of replacement sales to revenues over life by energy savings, requiring new **innovative finance models** to appropriately accommodate lighting systems and services
- Intelligent & communicating systems will lead to **lighting system providers**.
- Tailor made solutions will become a **growth opportunity for many SME's** by taking up the possibilities the new LED technology offers to creative lighting design and cost savings

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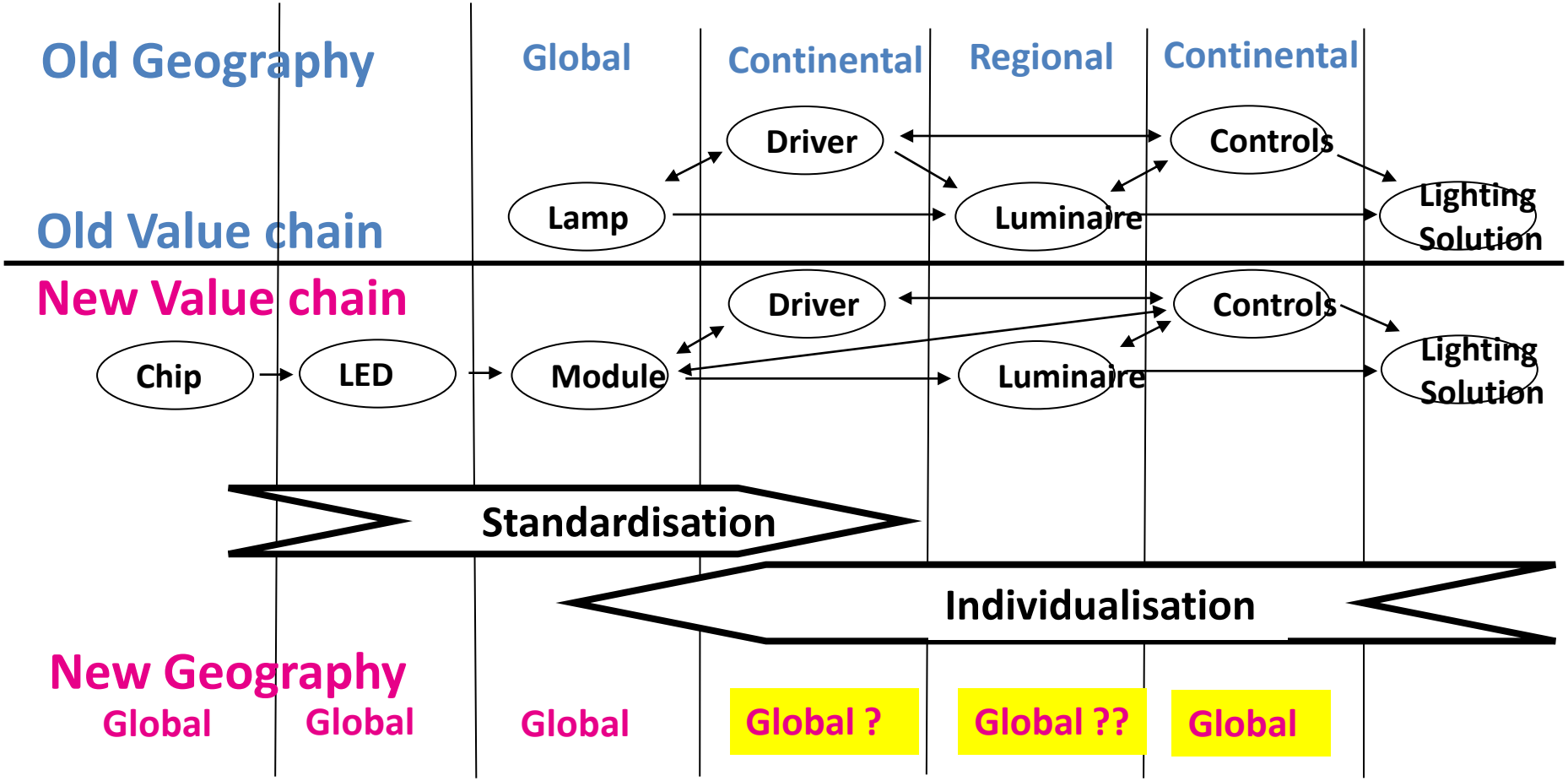
The Business Models are changing



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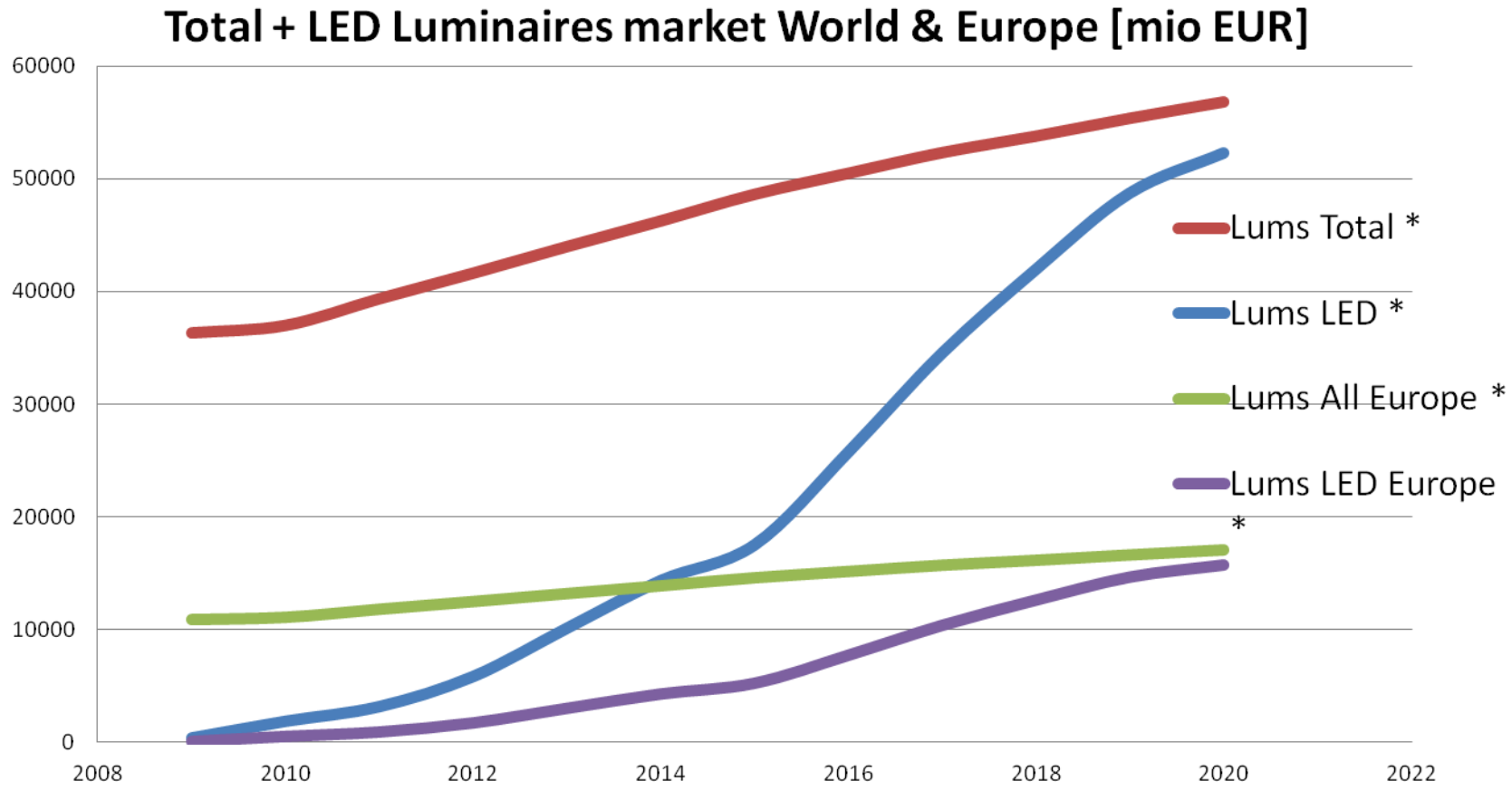
The Business Dimension



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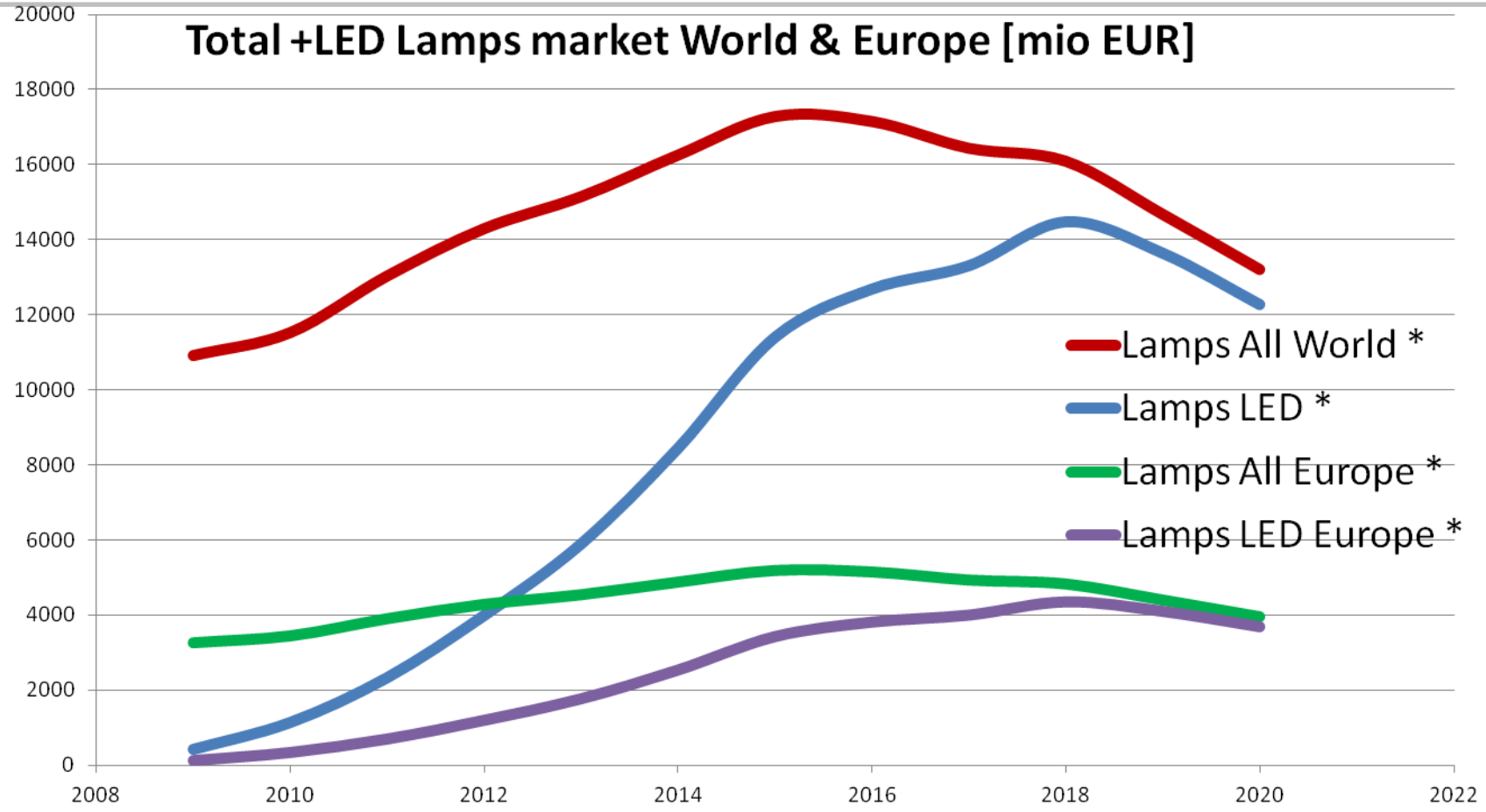
The Business Dimension



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Conclusion

- Benefits over all other lighting technologies are unique, as only SSL combines all eight dimensions
- Highly environmentally and energy friendly while ability to improve the quality of lighting
- A truly breakthrough technology in all aspects
- GLF is YOUR global platform to ensure successful deployment of Solid State Lighting

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Thank you

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