LED's, are we tricked?

Lamps and illuminants, a customer's viewpoint

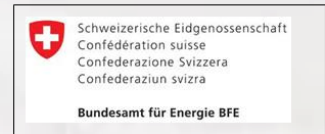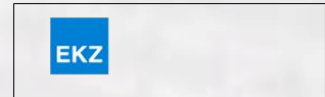HTW Chur
Hochschule für Technik und Wirtschaft

Fachhochschule Ostschweiz
University of Applied Sciences

2015-10-30, Lausanne, Smart Lighting, by Ulrich Hauser-Ehninger, Toni Venzin

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Der Klick zum besten Produkt!

# Who are we?

Energy efficie

fm LEUCHTEN

EKZ

micasa MIGROS

Lumimart

Lamps and

Illuminates

Zũblin

on onlog
innovation Supply

Motors

Hansa
world of service

[ S · A · F · E ]

EKZ

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Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Bundesamt für Energie BFE

# The Thread

1. The customer
   - Expectations
   - Receptions
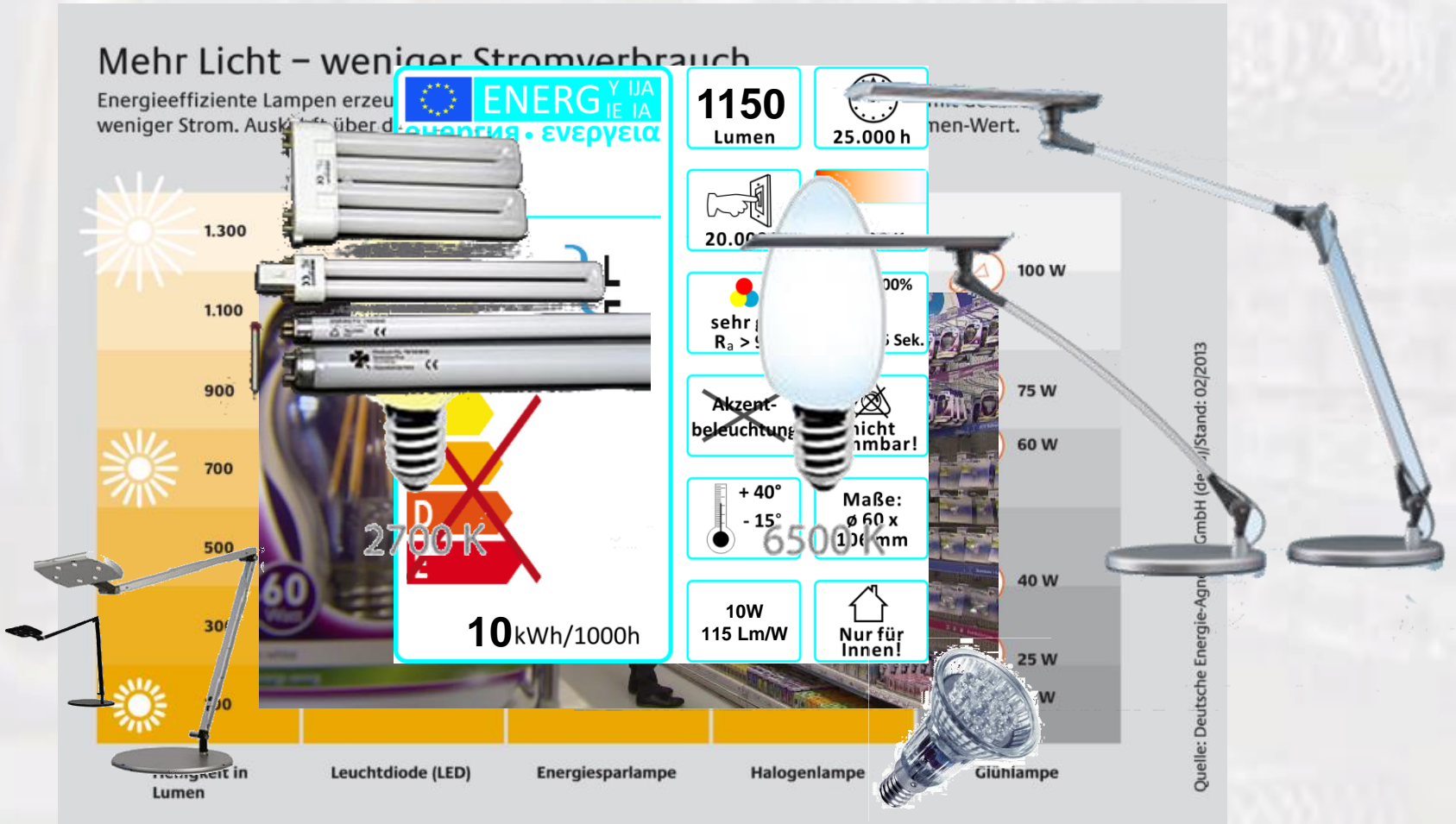   - Customer awareness
   - Experience of quality
2. What we measure
   - Electrical characteristics
   - Light characteristics
   - Findings
3. Suggestions for improved customer experience
   - Declaration
   - Technology

# Customer expectations

# Customer receptions (directly back at home)

| | LED (no retrofit) | LED (retrofit) |
|---|---|---|
| The lamp is fine | | |
| The lamp is too dark | Take to shop | Change illuminate |
| The lamp is too bright (in places) | Take to shop | Change illuminate |
| The lamp cannot be dimmed | Take to shop | Change illuminate |
| The light is not as cosy as expected | Take to shop | Change illuminate |

# Customer receptions (After some usage time)

| | LED (no retrofit) | LED (retrofit) |
|---|---|---|
| The lamp is fine | | |
| An illuminate died | Take to shop | Change illuminate |
| The colour changed significantly | Take to shop | Change illuminate |
| The power supply broke | Take to shop | Replace supply |

Customer Awareness

Standby Power Consumption

Colour Temperature

Design & Style
Price
Brightness
Ambiente
Power consumption
Environment Issues

Light Distribution

Grey Energy

Maintenance/Repair/Refit

Colour Rendering Index

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# Experience of Quality

unobtrusiveness

longevity

rigidity

reliability

continuance

ease of use

… the totality of features and characteristics of a product or service that bears its ability to satisfy stated or implied needs (ISO 8402-1986).

# What we measure

- **Electrical Characteristics (In use and Standby situation)**
    - Power consumption
    - Power factor
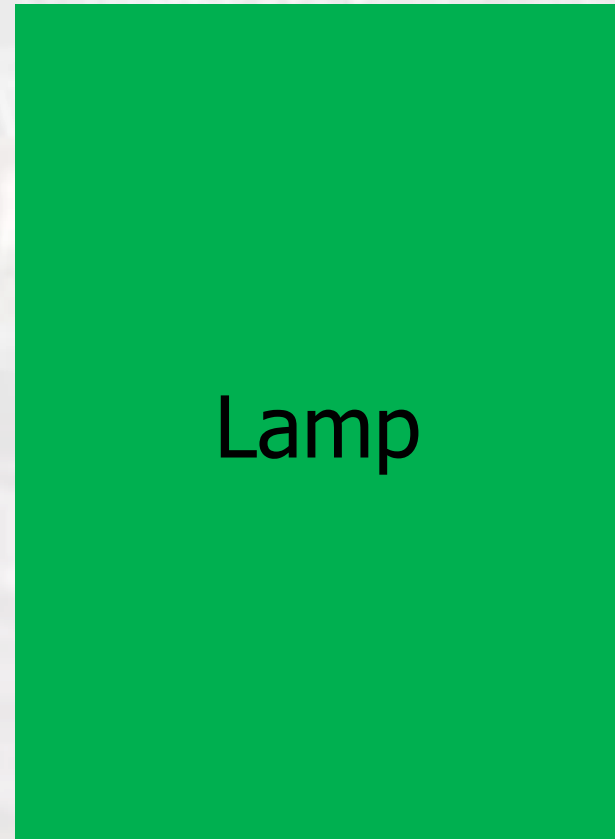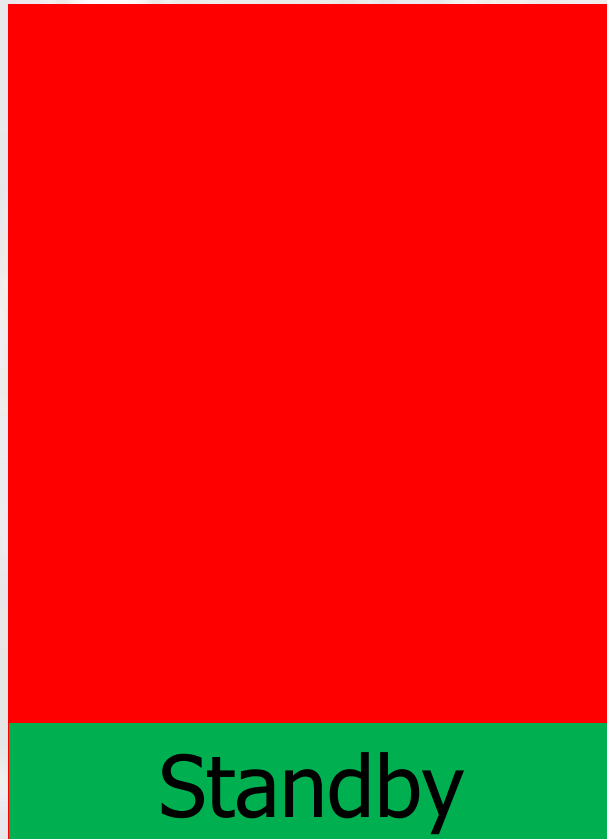    - Repercussion
    - Energy Consumption

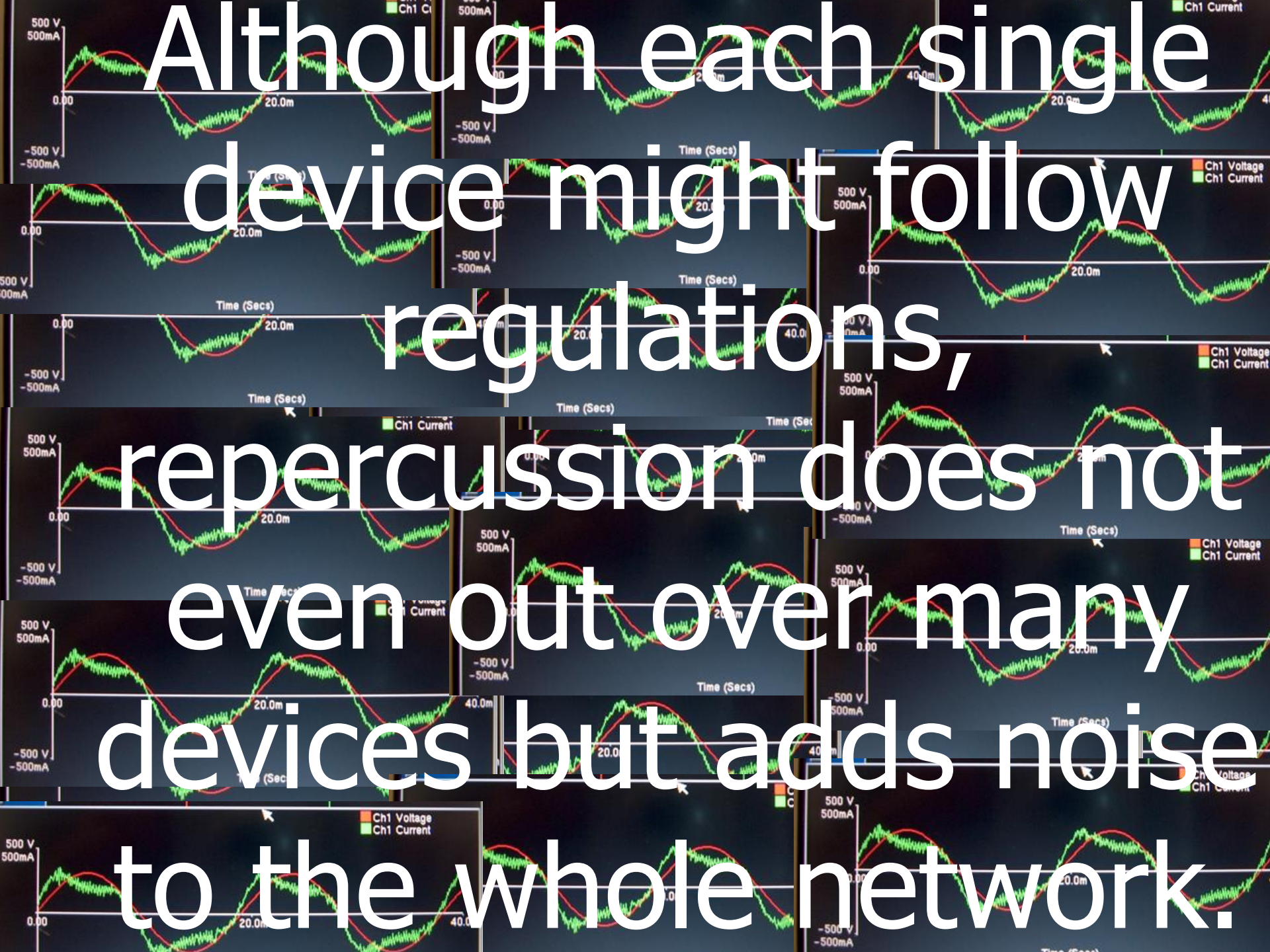- **Illuminance [Lx] on a defined area or on a disc surface**
- **Luminous Flux [Lm]**
- **Illumination quality**
    - Glare
    - Light distribution
    - Colour temperature
    - Colour Rendering Index
    - Spectrum

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# Measurement Results (electrical characteristics)



Standby

Lamp

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Although each single device might follow regulations, repercussion does not even out over many devices but adds noise to the whole network.

# Measurement Results (luminous flux)

- The luminous flux is declared on the package
- With illuminants the values are mostly found to be of tolerable accuracy
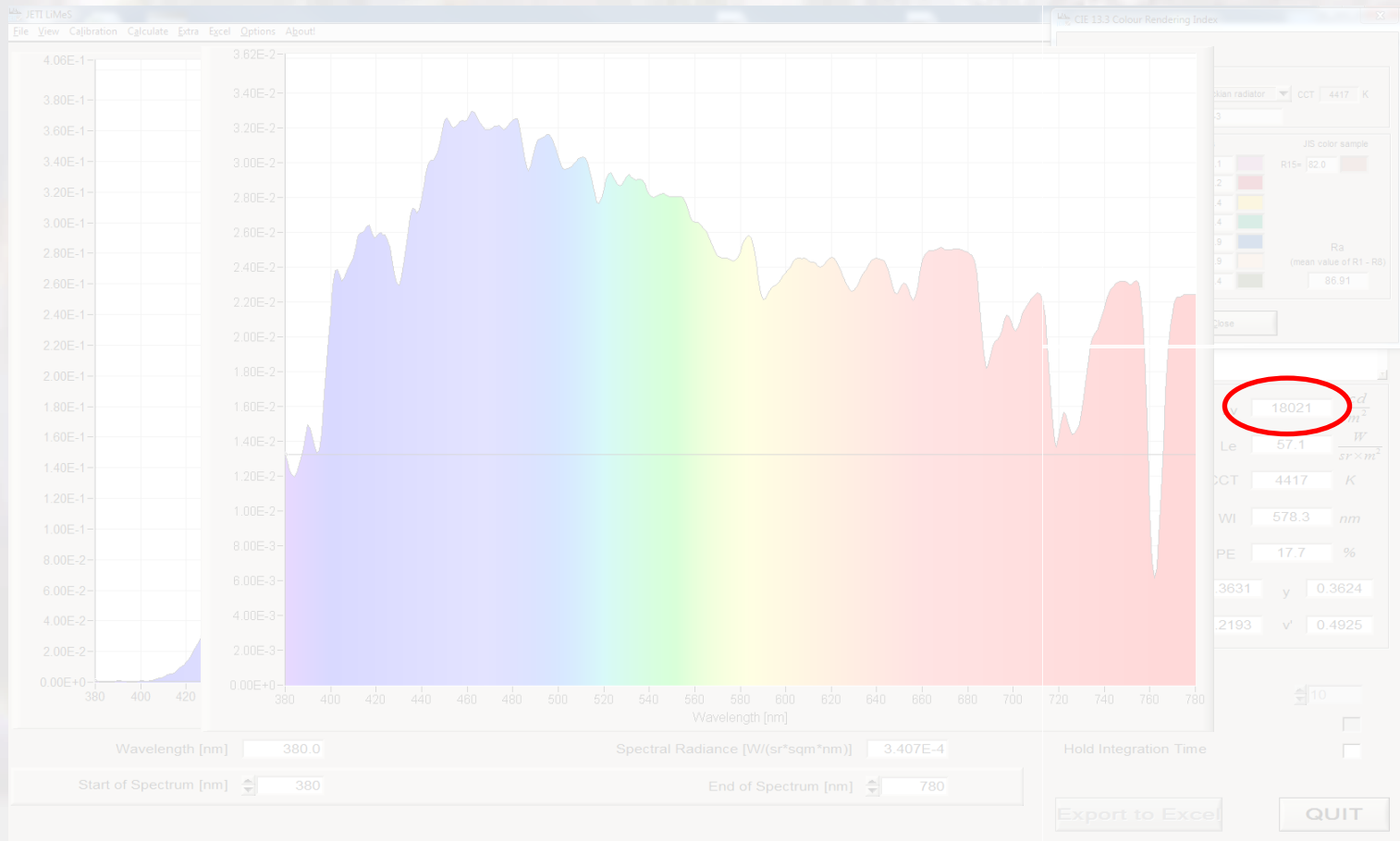- With lamps the real values are very often found to be significantly lower than the declared one

# Measurement Results (distribution)



St Osram CL A 80 (M2) 12W
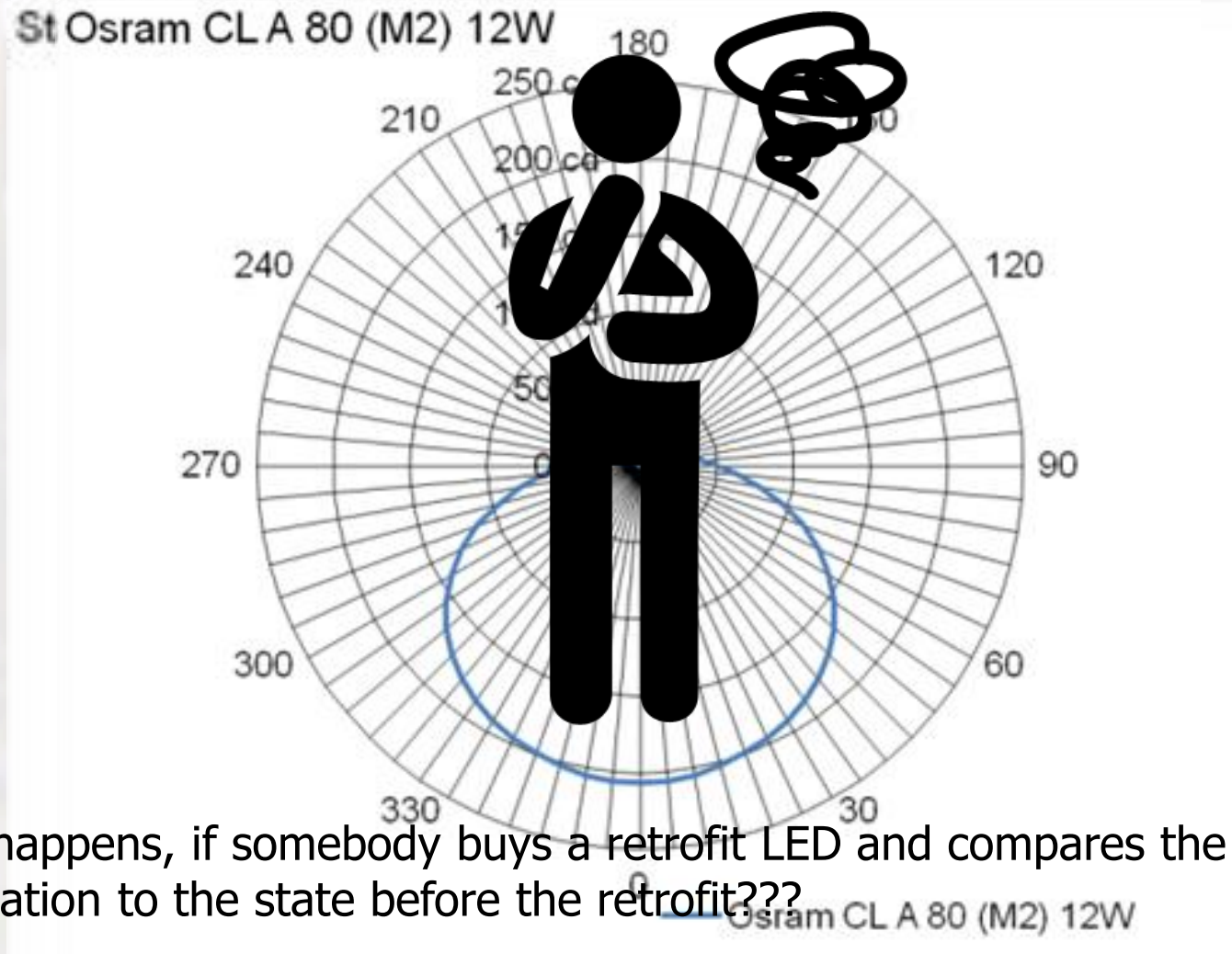
What happens, if somebody buys a retrofit LED and compares the room illumination to the state before the retrofit???
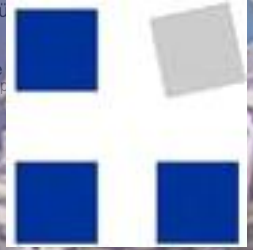
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# Measurement Results (spectrum)

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Suggestions for activities to improve on user experience

# We Need You...

1. It needs to be compared to the [...] the packaging and illumination [...] implications of the delivered ch[...]

2. Customers need [...] and implication [...] illumination tec[...]

3. Slim sockets ne[...] average custom[...] modern design ba[...]

4. I am quite certain that I ha[...] front of me for such an appeal.

48mm

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- LED´s will replace most of the other light sources
- There is a need to inform the customers about the implications of this technology
- To make full use of LED technology in a sustainable context, additional adjustments in technology like slim sockets need to be made and regulated

Thank you for your attention

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