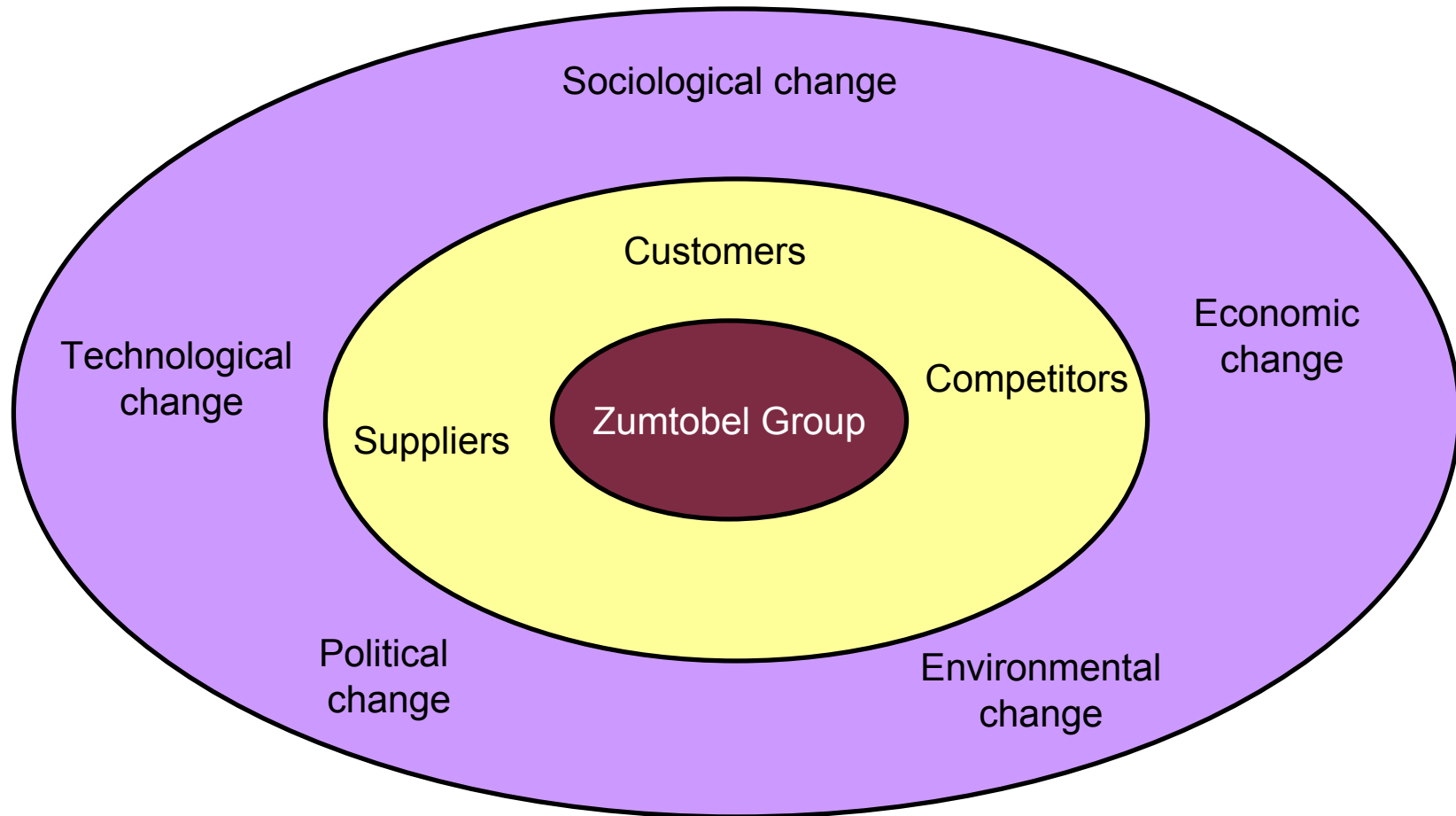


Zumtobel Capital Markets Day

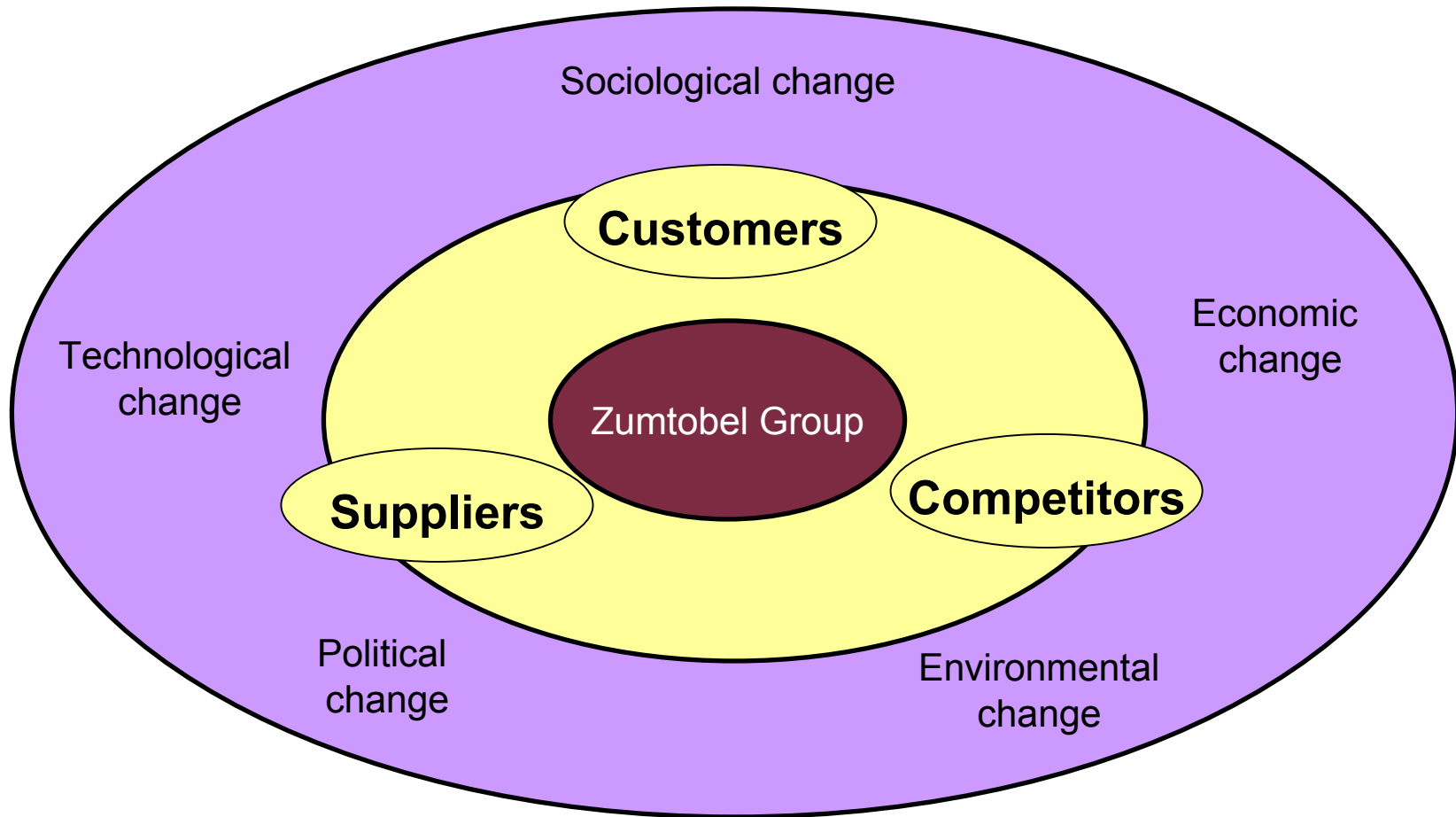
**Zumtobel Lighting Division
"Technology and Product Roadmap"
Klaus Vamberszky**

M. Porter's model of 5 forces

Forthcoming changes in the lighting business

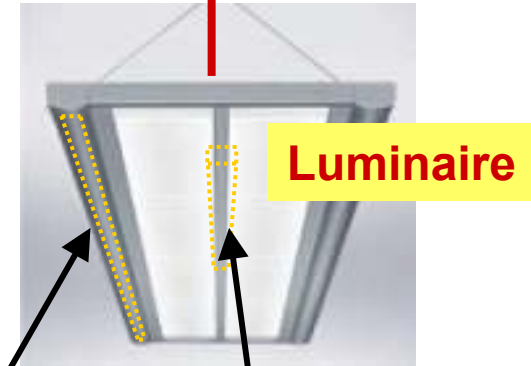


Focus on inner circle – the lighting business itself



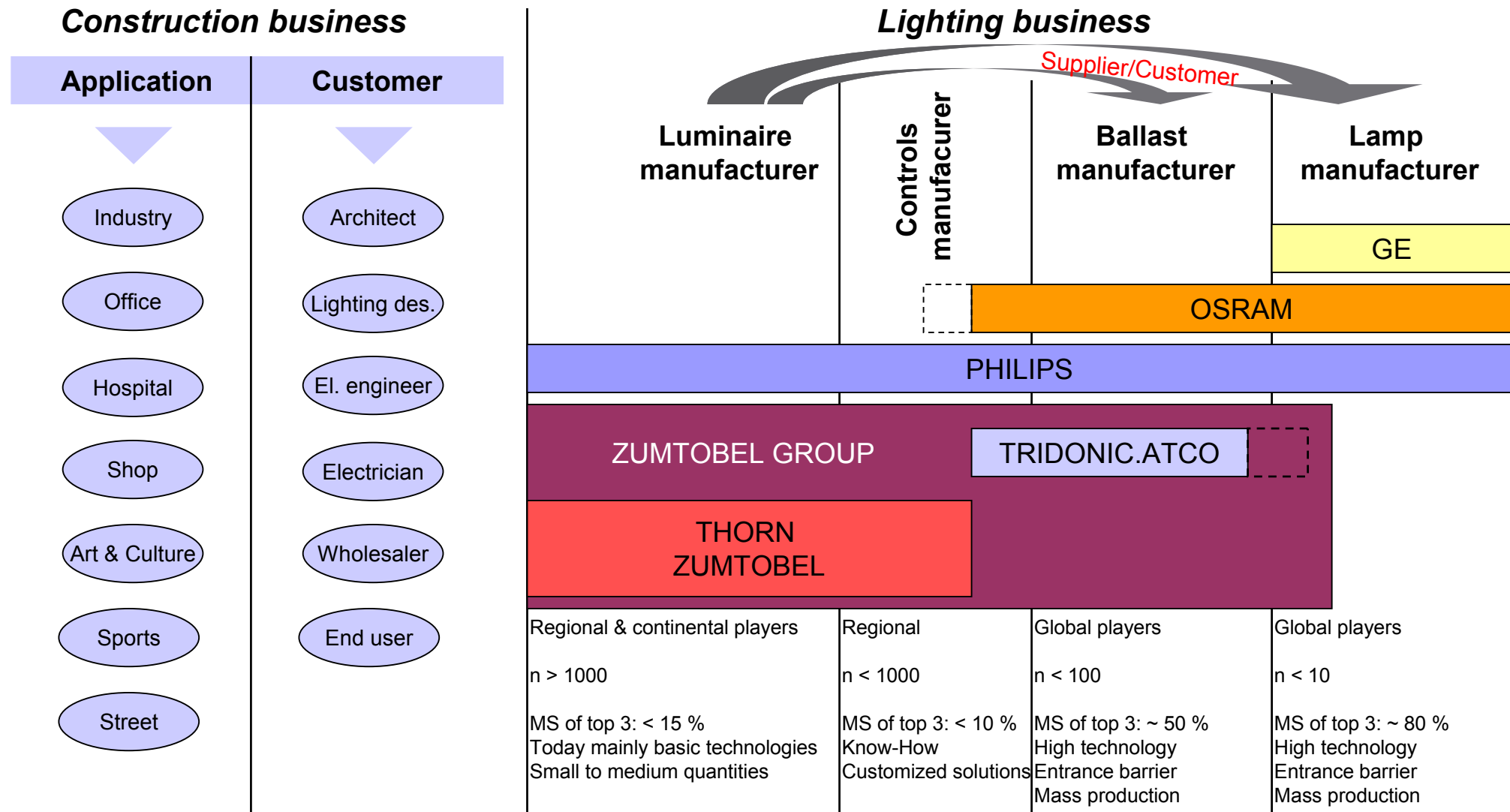
4 different businesses within the lighting industry

Components of lighting solution

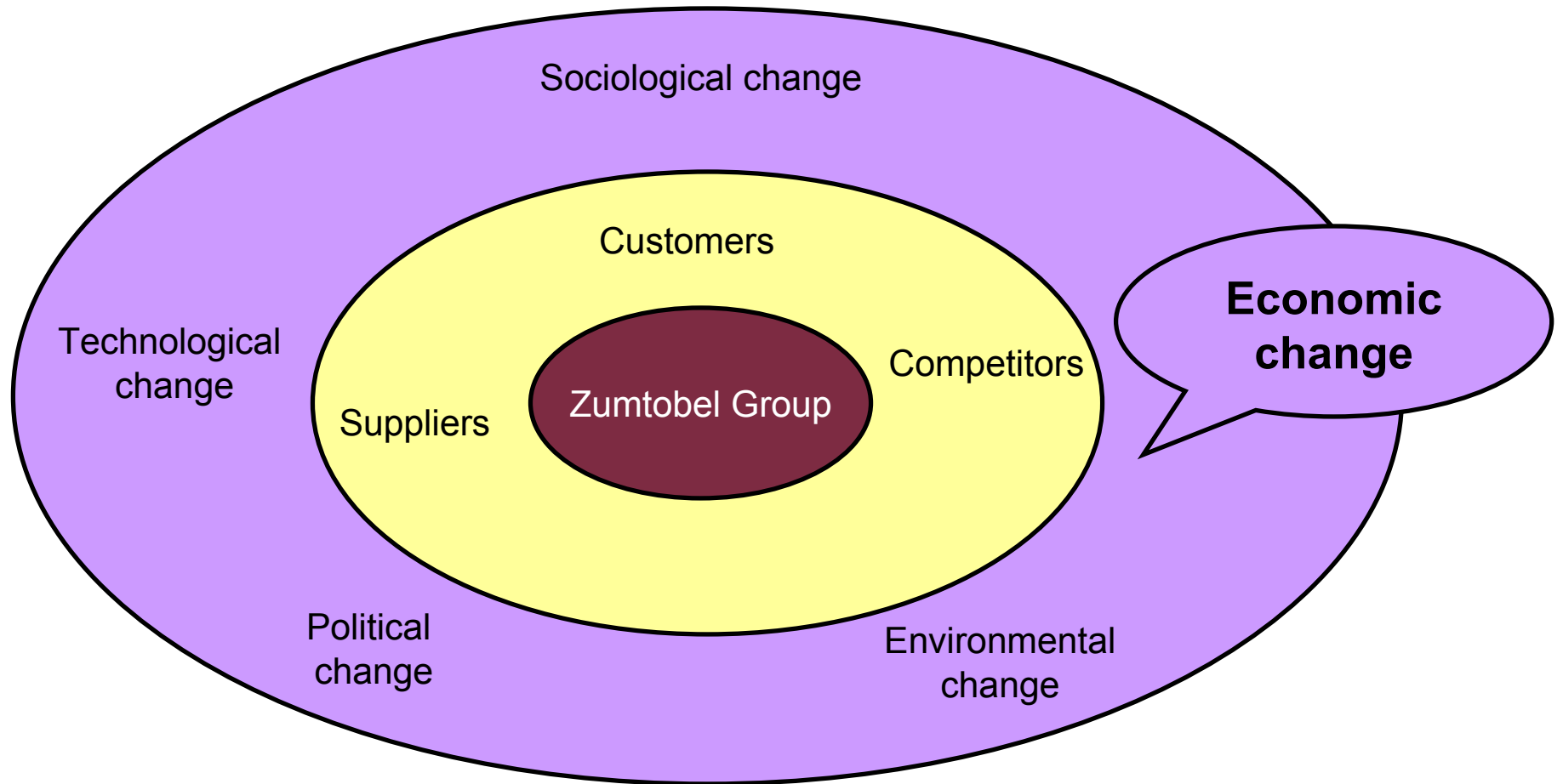


Lighting business is part of construction industry

Structure of the lighting business



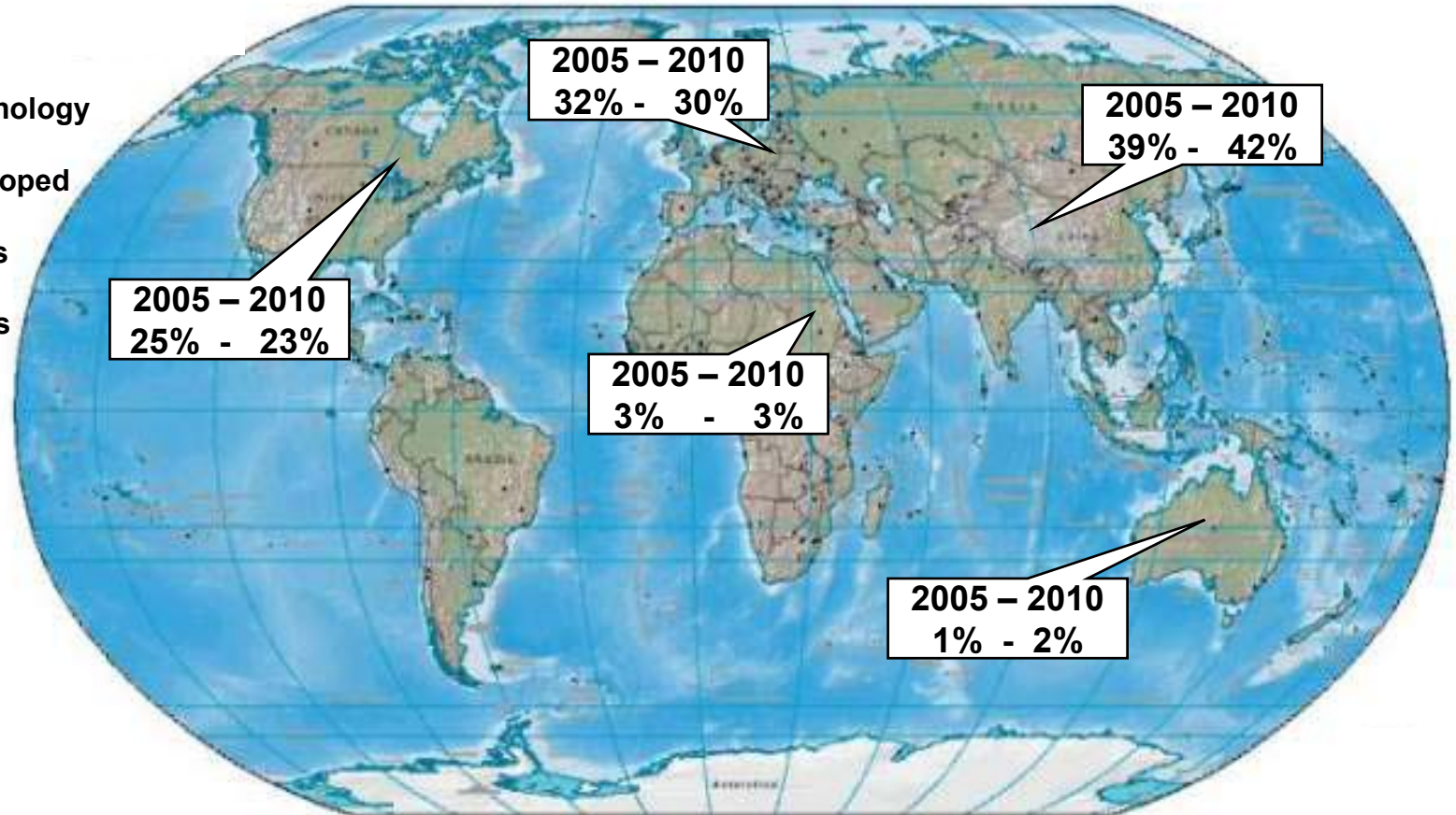
Economic change



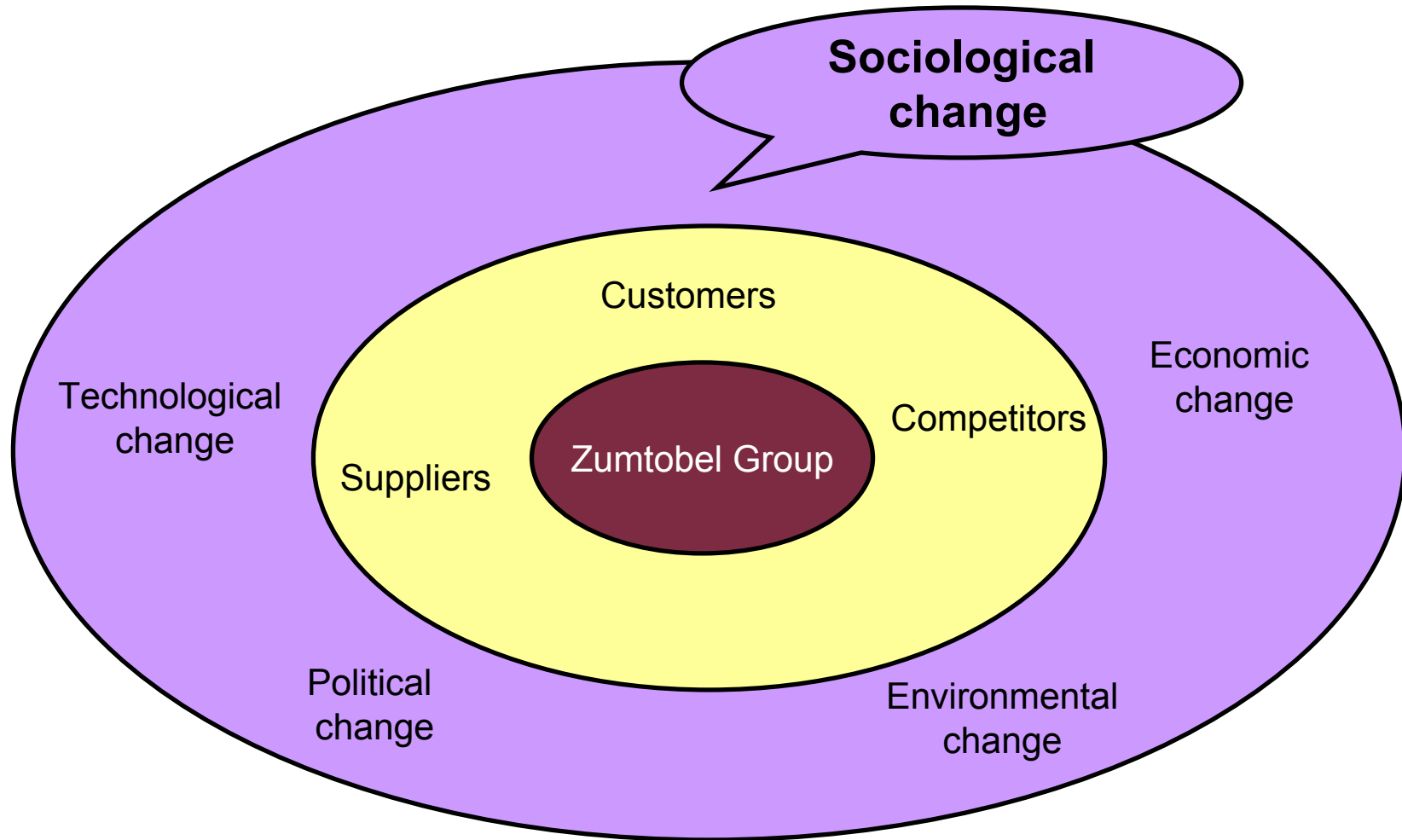
Economic change

Business goes East but lighting business is slow

- Western Europe highly developed in lighting technology
 - Asian countries less developed
 - West – East divide remains
- ⇒ Only little change in sales distribution



Sociological change



Sociological change

4 main drivers for lighting

24-h society



Information



Wellness, wellbeing, health

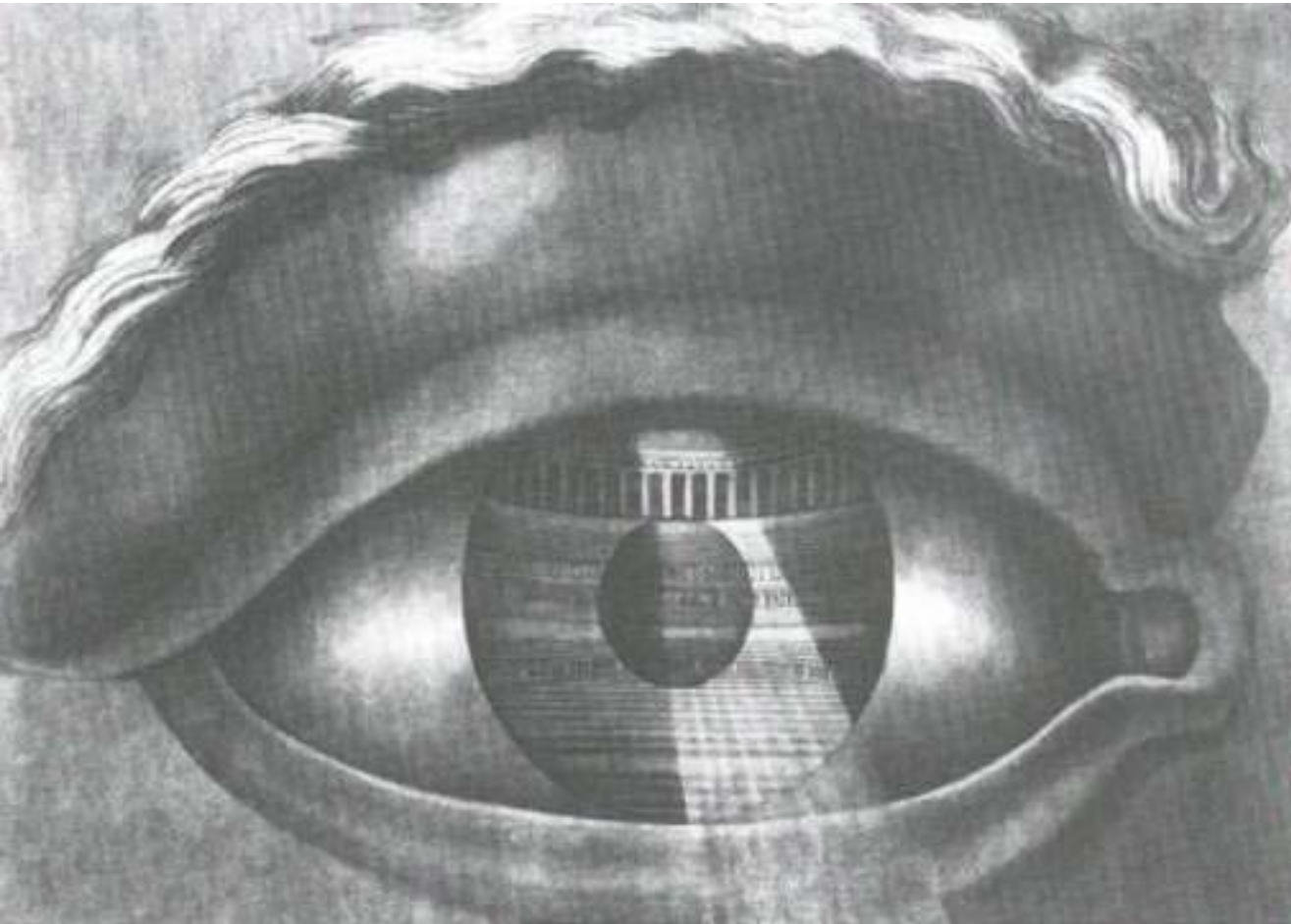


Ageing society



Sociological change

Light and ... the information age



People are visual animals.

**They perceive or take in 90 %
of all information via their eyes.**

We live in a visual world.

**Information is inextricable
linked with light !**

"For every beauty there is an eye somewhere to see it." Ivan Panin

Sociological change

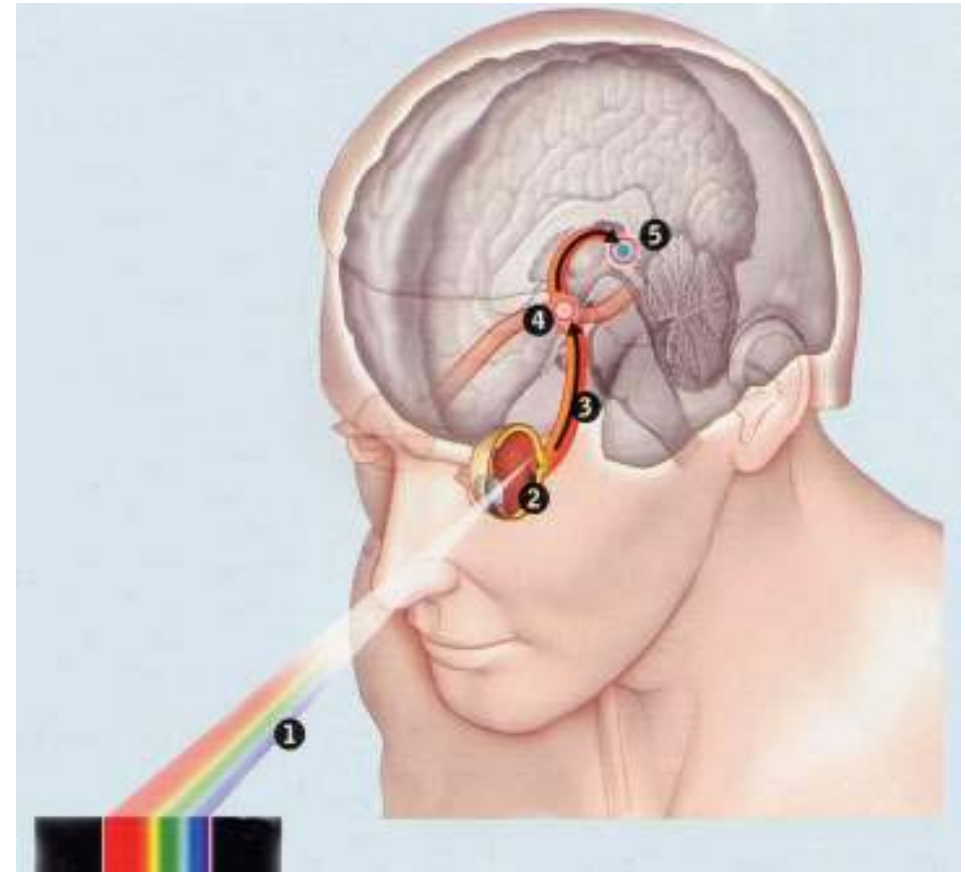
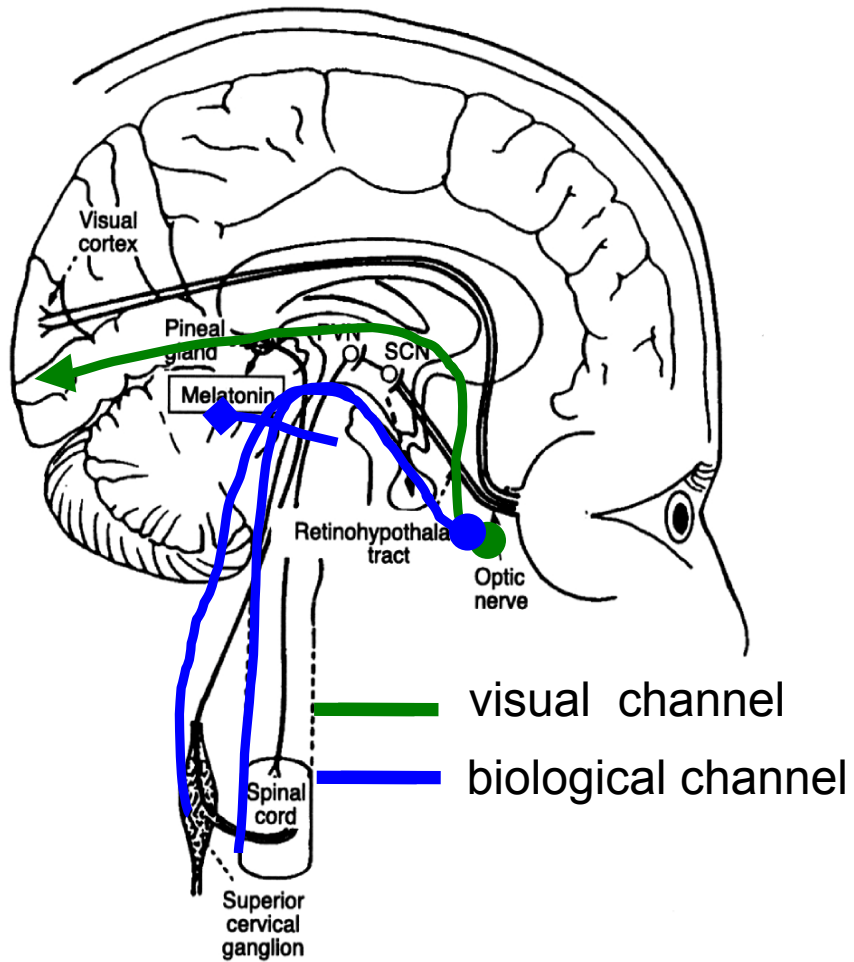
Light and ... the information age



Kunsthaus
Graz

Sociological change

Light and ... wellbeing & health



Sociological change

Daylight ("natural" light) is very dynamic

Moonlight: 0.1 Lux



Cloudy day in autumn or winter: 3.000 – 4.000 Lux



3.000 - 4.000 Lux bei bewölktem Herbst / Winter Himmel

Shade in summer: 10.000 Lux

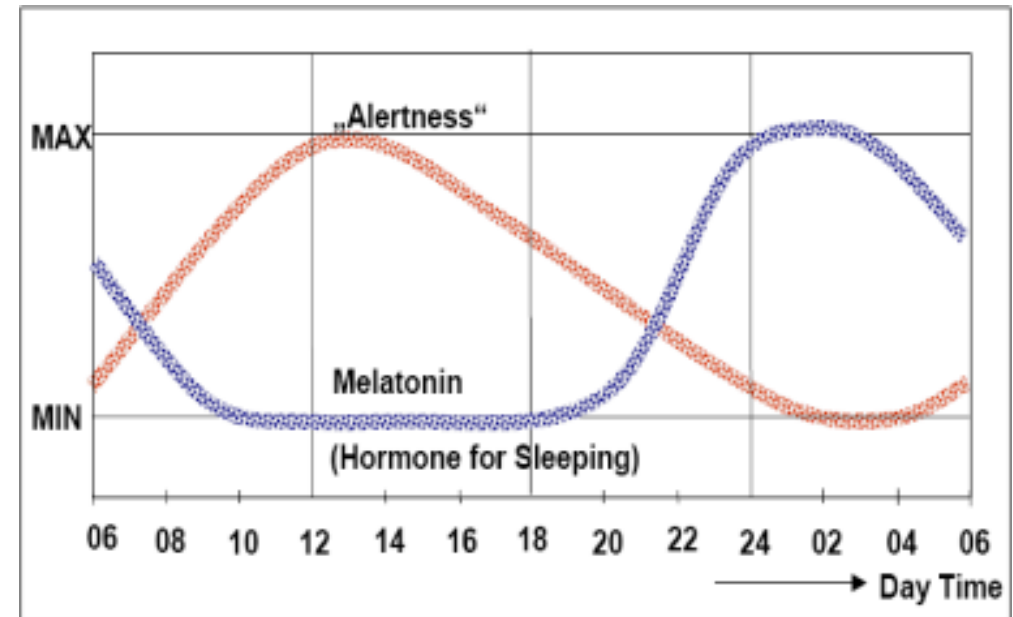
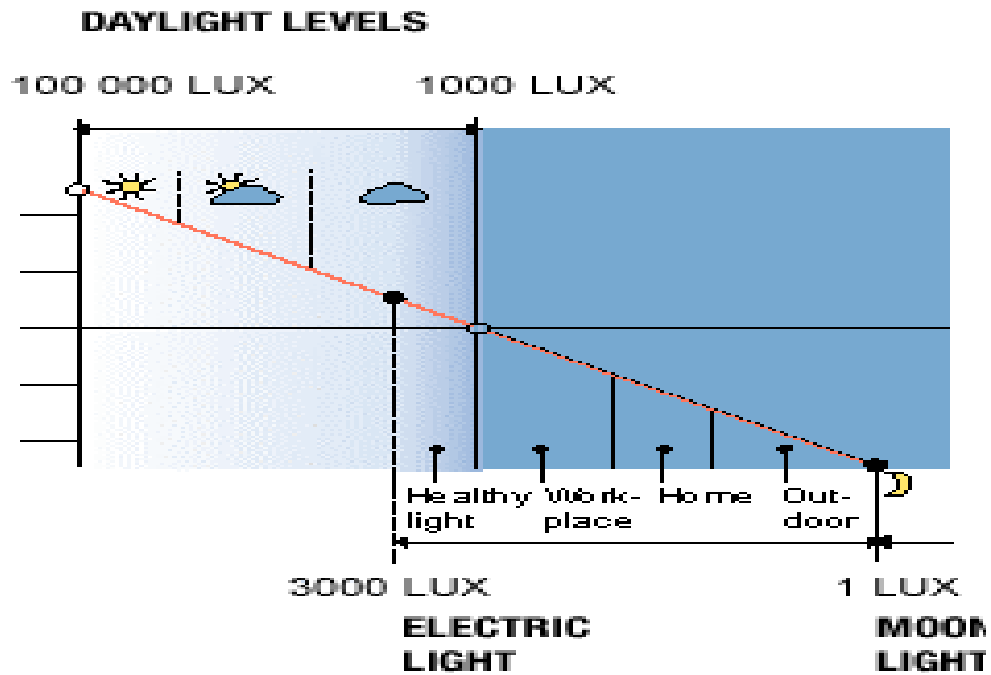


Sunny day in summer: 100.000 Lux



Sociological change

Dynamic light, dynamic people !



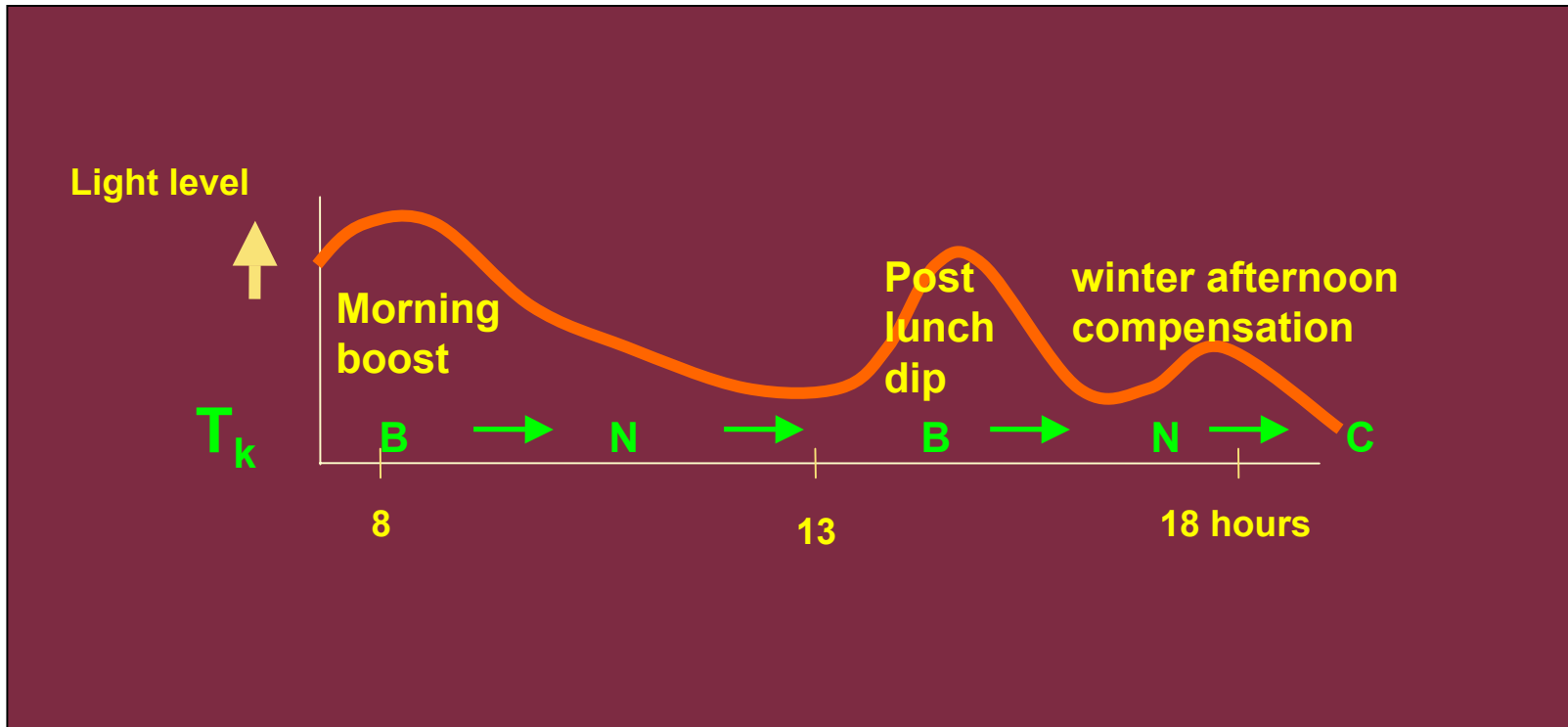
Huge variance in lighting level

Artificial light levels mean "biological darkness"

Only high light levels guarantee circadian rhythm.

Sociological change

Light and ... the 24-hour society



The "right light" gives people wings !

Sociological change

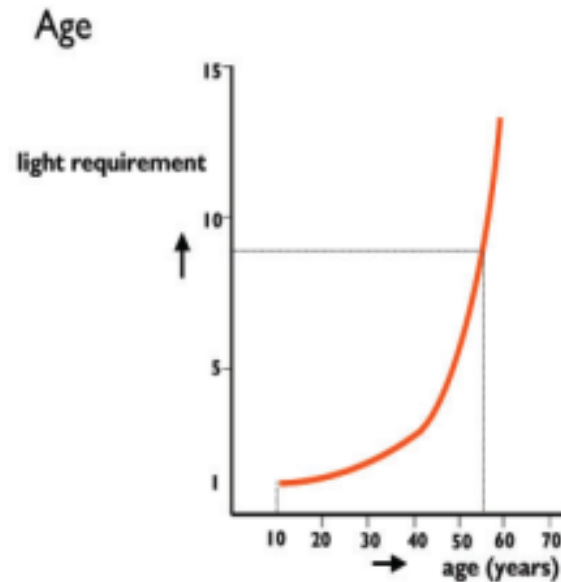
Light for vision and light for wellbeing



Eyes are windows to the soul

Sociological change

Light and ... the ageing society



source: Fortuin

Source: George Kok, Philips Lighting

Elder people need more light.



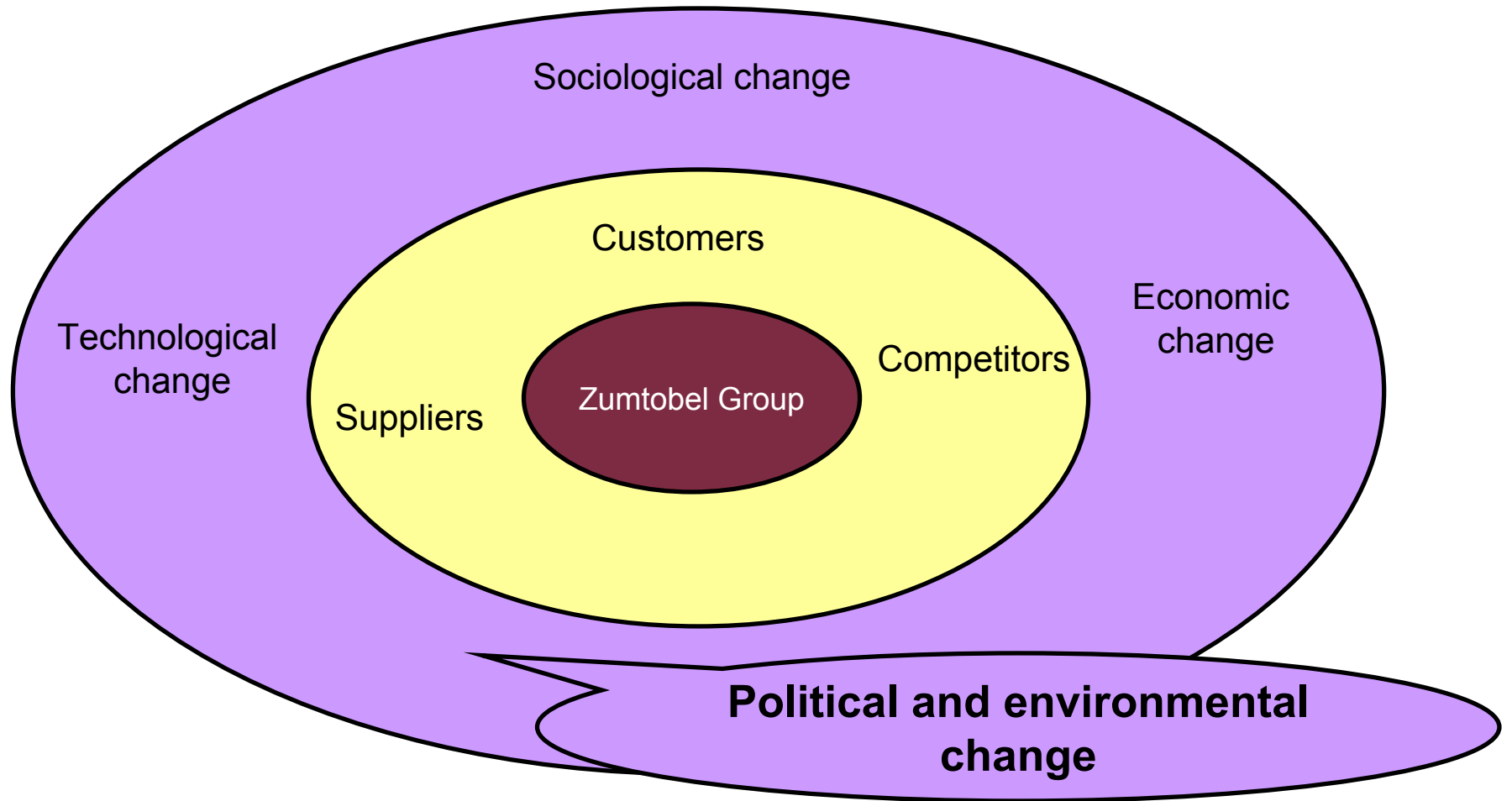
The "Right light" in homes for elder people reduces drug consumption.

-10 % of the world's population is elder than 60 years

- Increase in aging by 2050:
People over 60 will reach 21 % of population

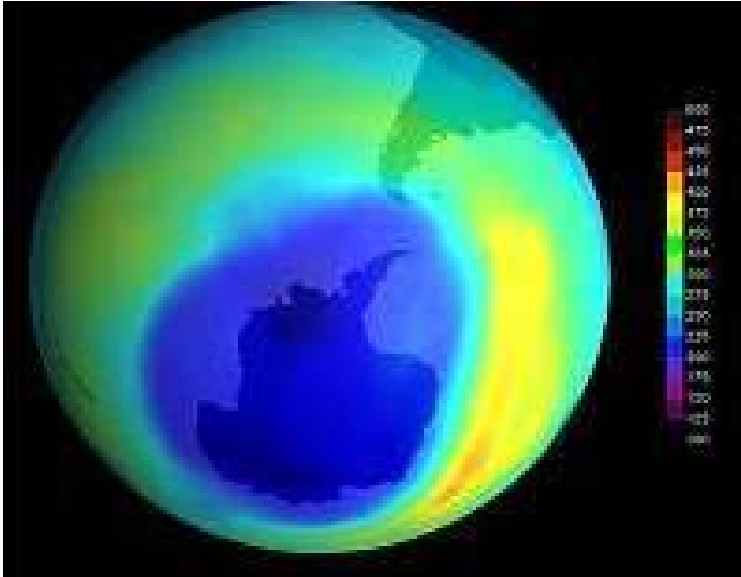
Source: United Nations. World Population Prospects:
The 2000 Revision Highlights. February 2001, pp.14-15

Political and environmental change



Political and environmental change

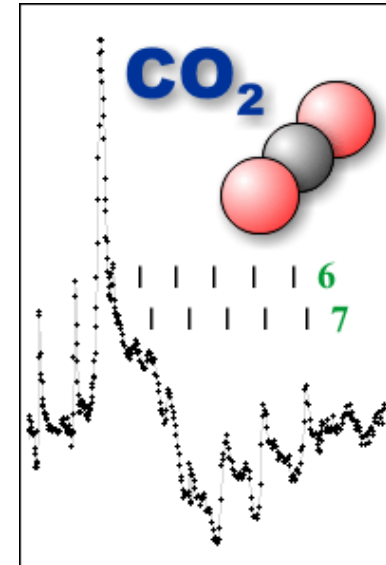
Target CO₂ reduction



Increase in mean temperature of approx. 2-4 K forecasted for 2100 by IPCC.



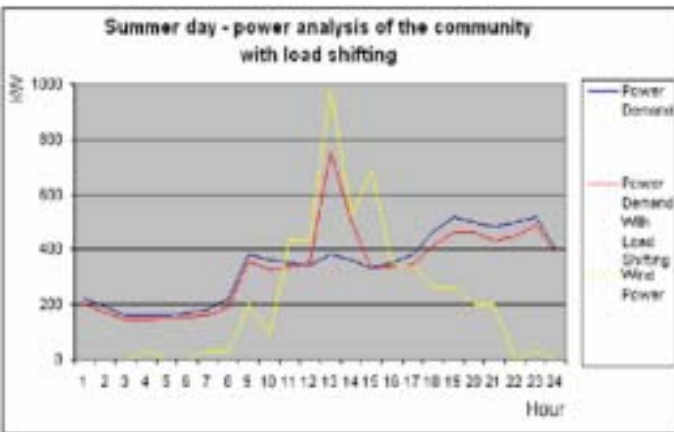
Reduction of emissions, especially CO₂, required



Approx. 10 % of the energy in an office building is used for lighting.

Political and environmental change

Reduction of energy consumption



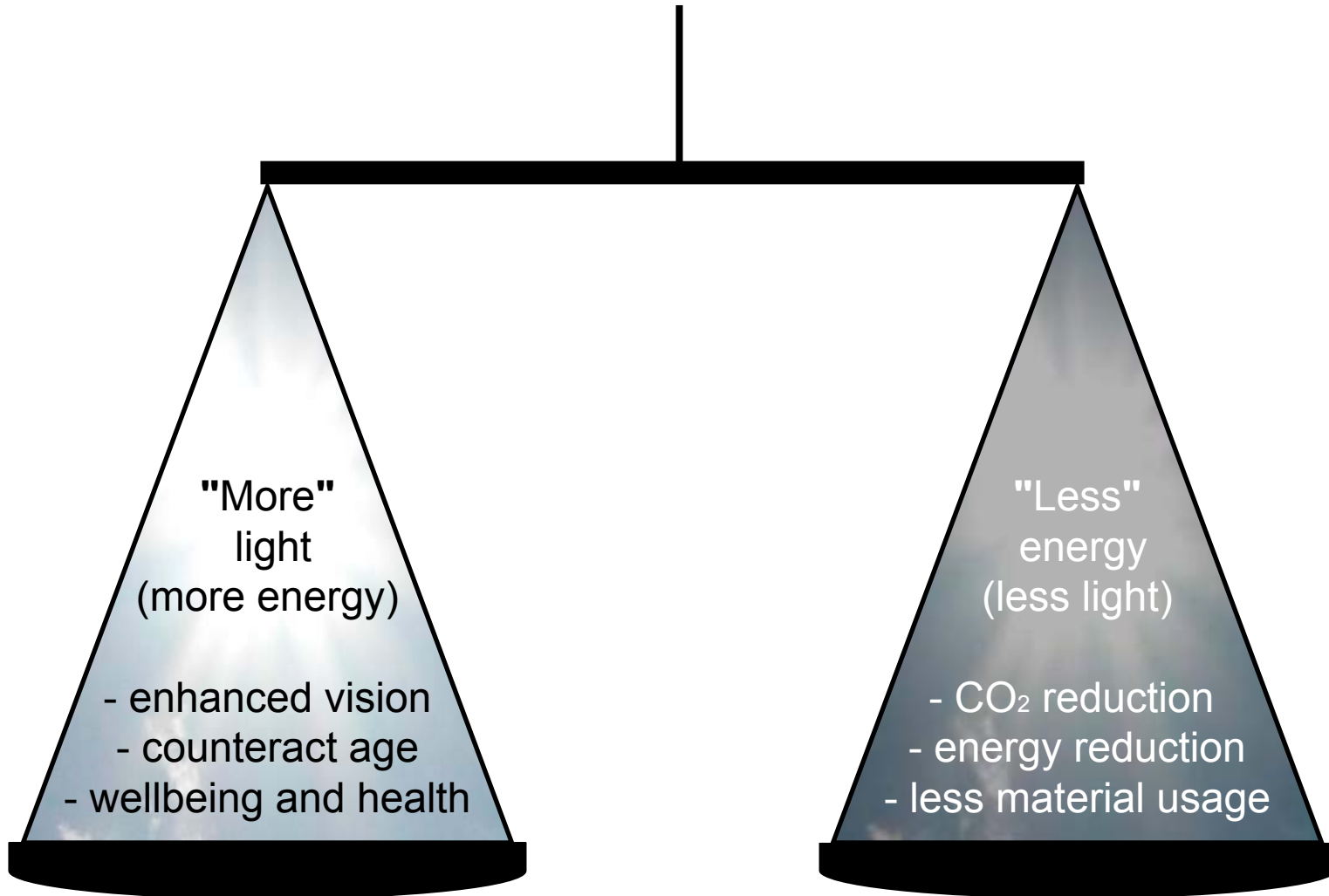
Electrical energy for lighting is needed when general consumption is high-peak load.

Intelligent daylight – linked daylight Management systems can save up to 75 % of electrical energy used for lighting.

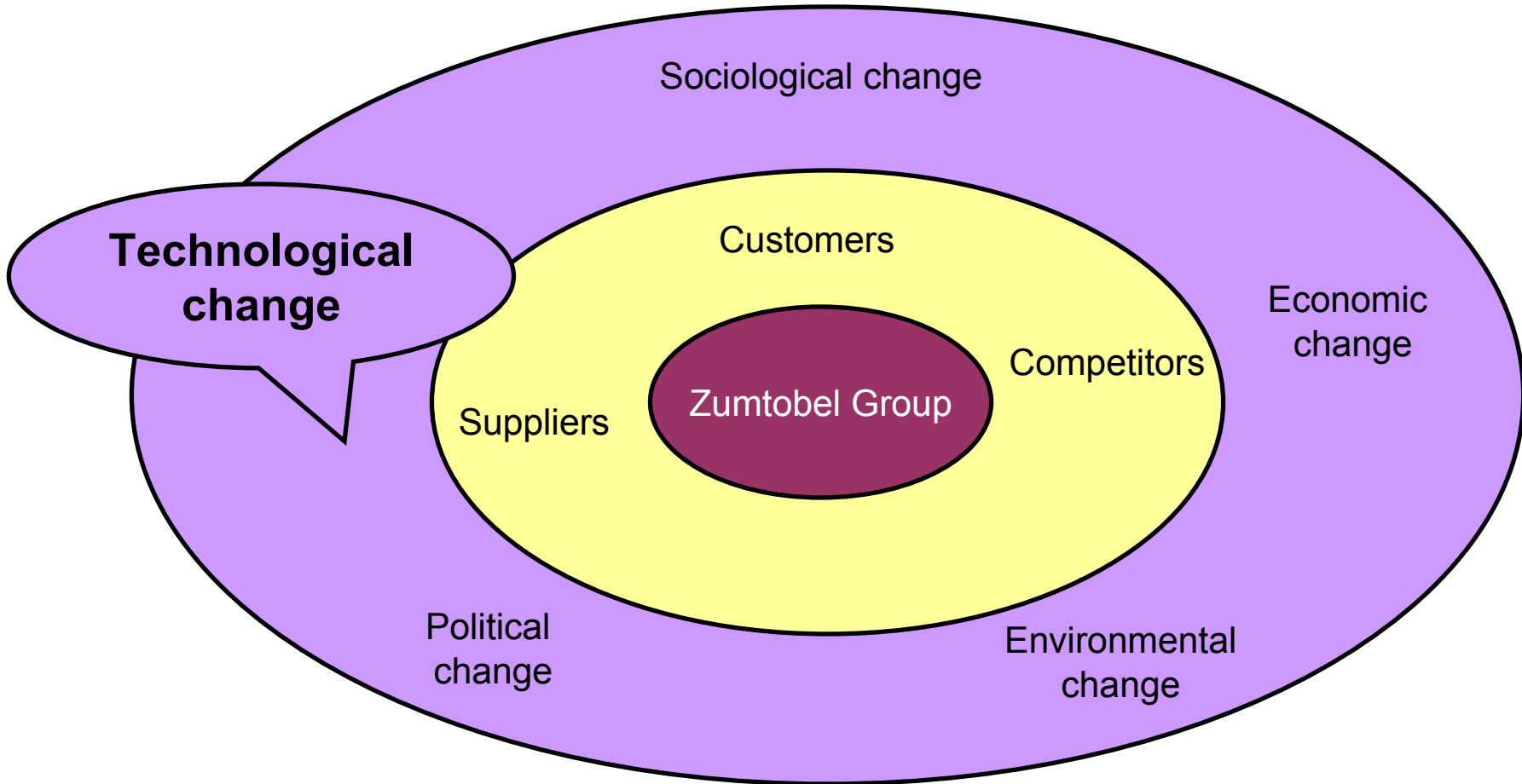
Toyota Prius

Political and environmental change

Balance with intelligent solutions – Humanenergy Balance

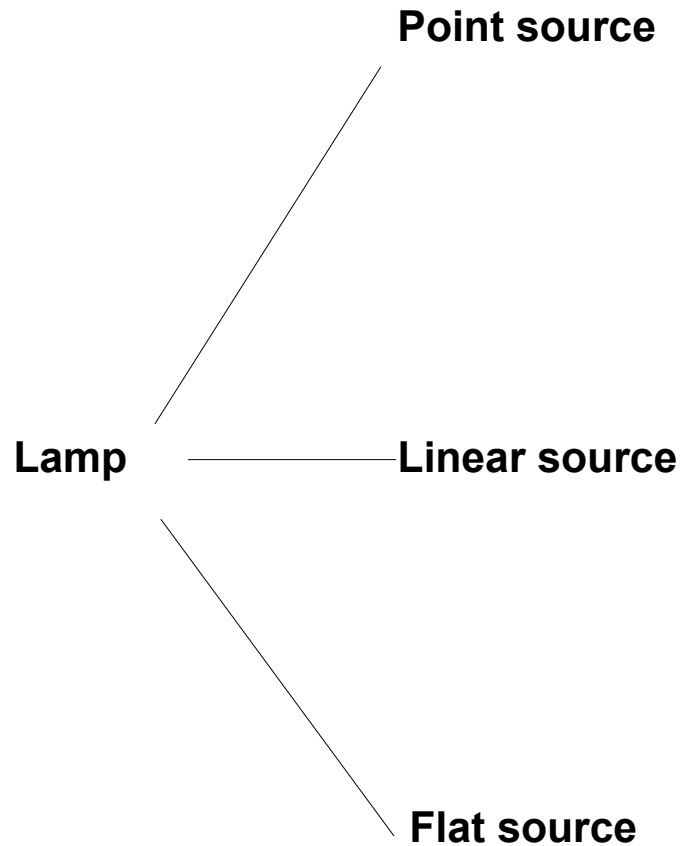


Technological change



Technological change

Light source: from incandescent bulb to LED and OLED



LEDs
Small wattage metal halide lamps
Halogen lamps



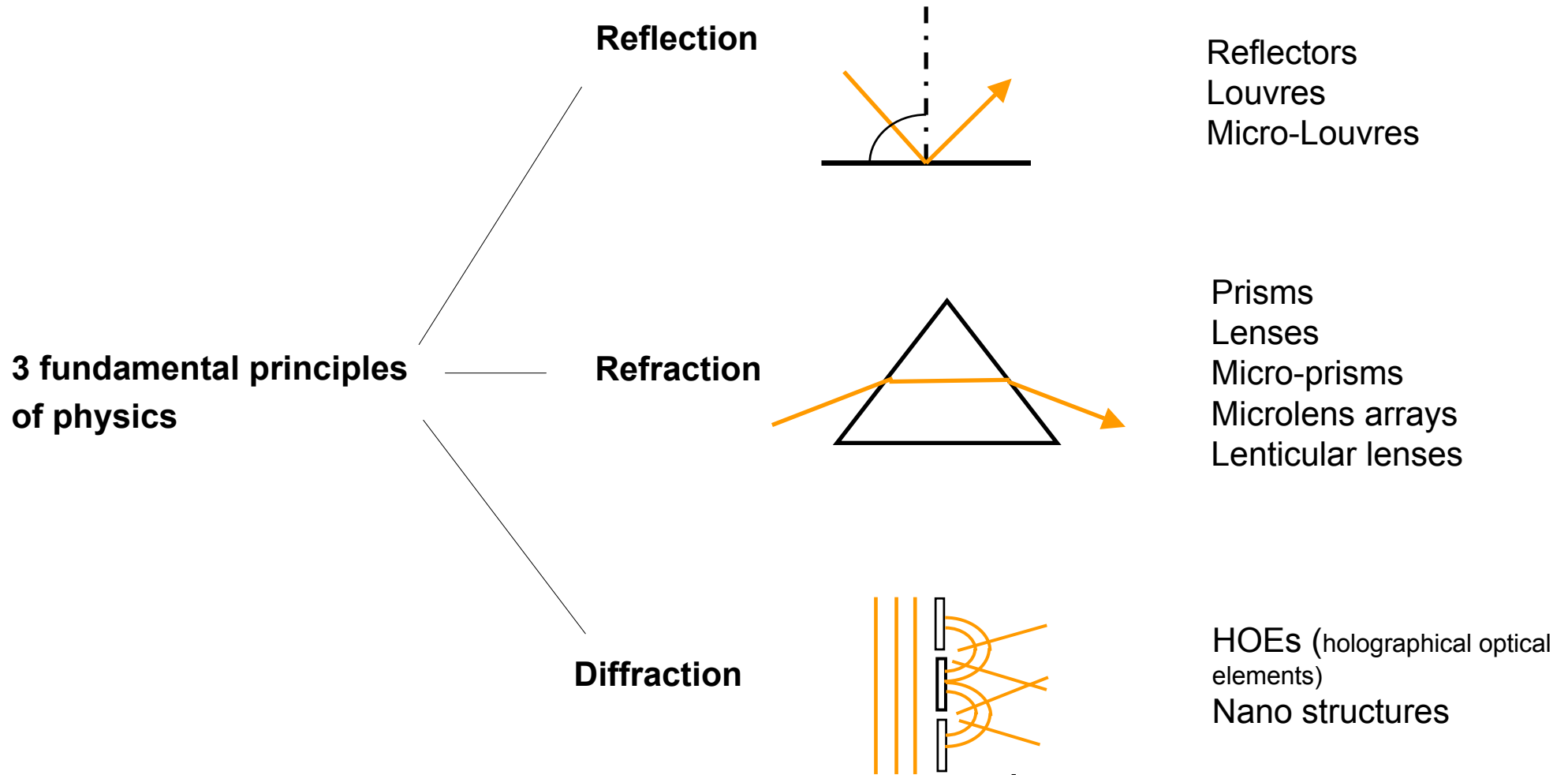
Fluorescent tubes
Compact fluorescent



OSRAM Planon
OLED

Technological change

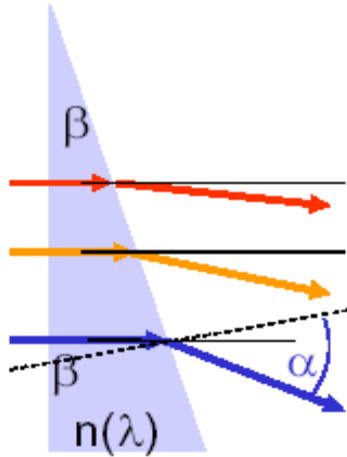
Direction of light: from macro to micro to nano



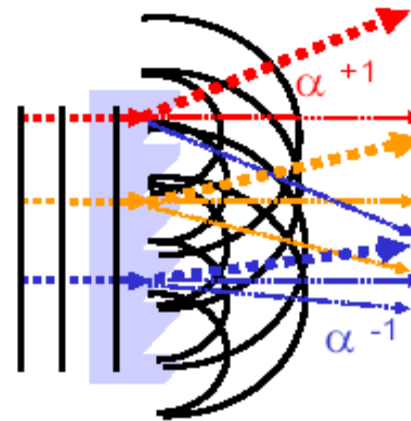
Technological change

New structures: diffraction instead of refraction

Refractive



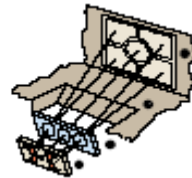
Diffractive



- Wide range of materials (glass, polymer,..)
- Small components, light weight
- Realisation of new optical functions
- Potential of large-scale production
- Low costs

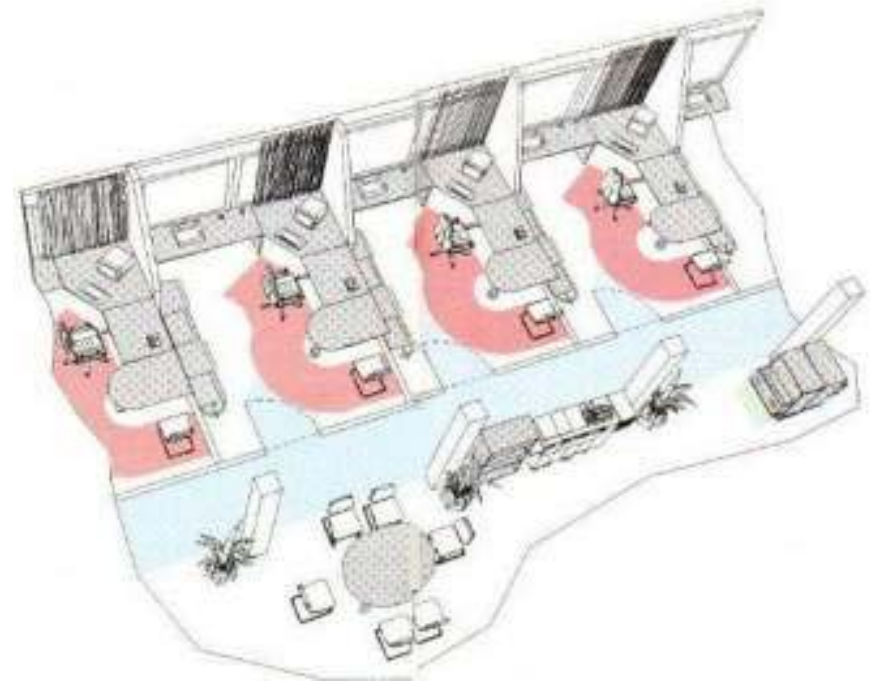
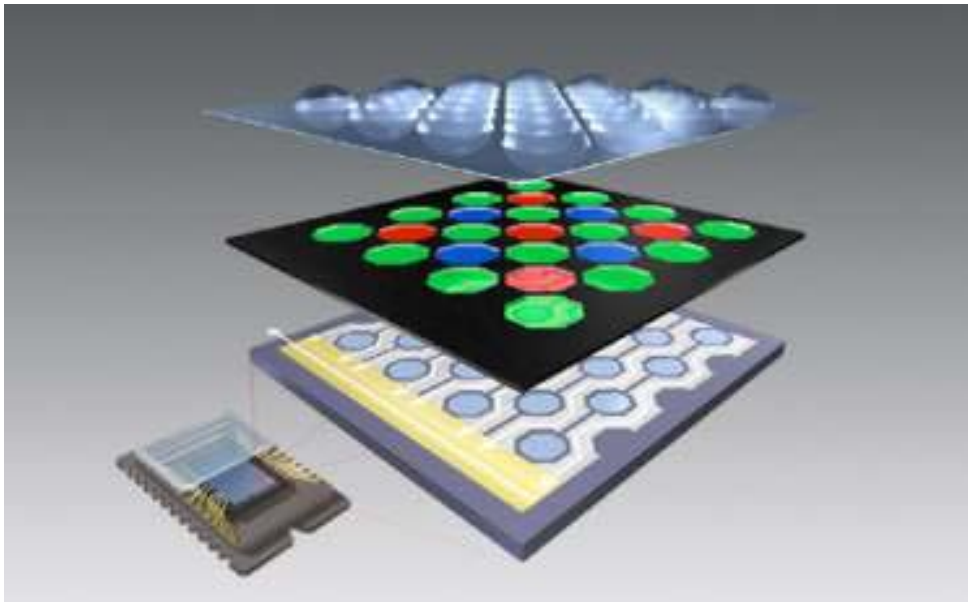
Technological change

Built-in intelligence: the intelligent camera



Technological change

Built-in intelligence: the intelligent luminaire



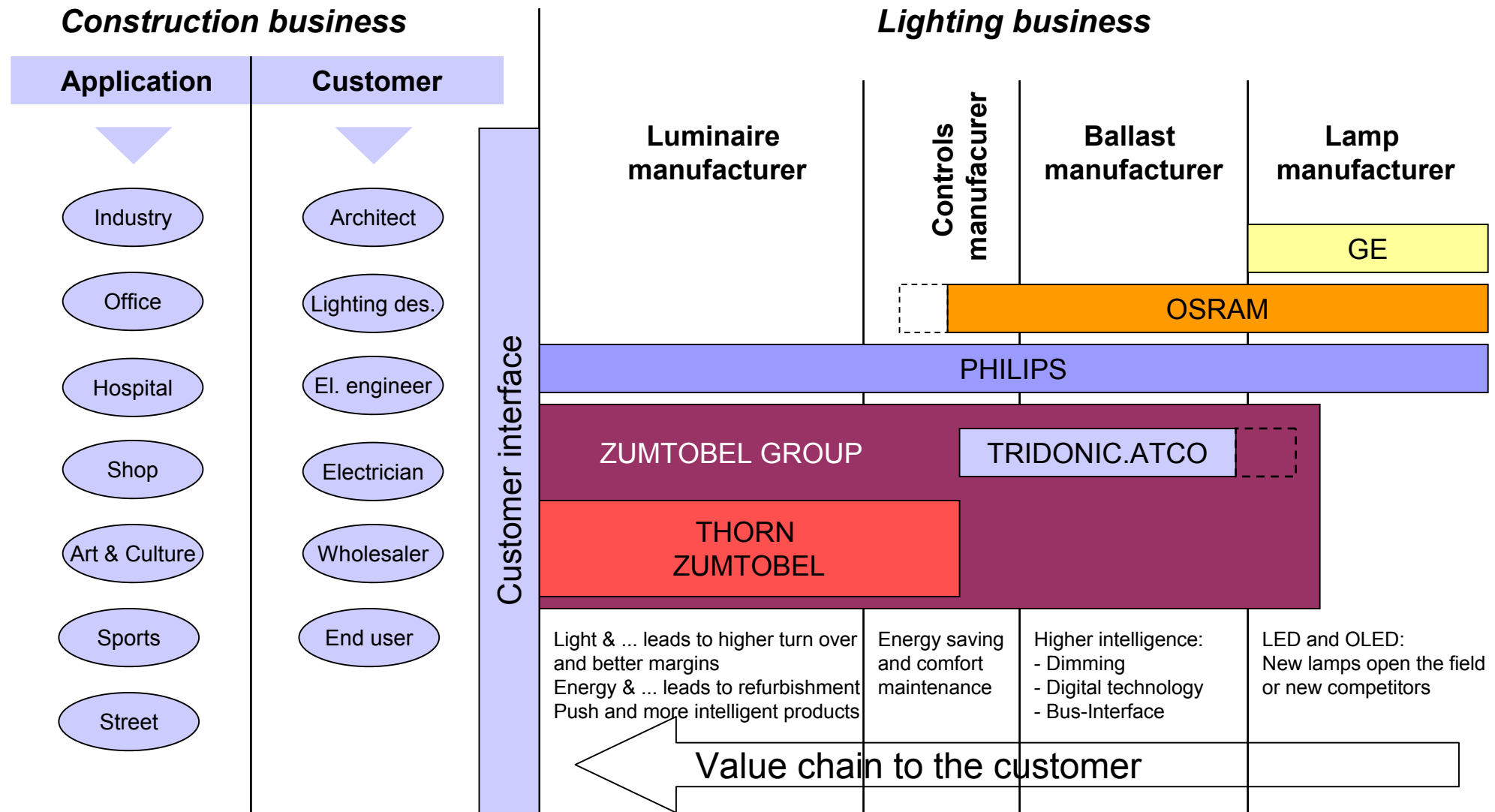
Technological change

Built-in intelligence: the intelligent luminaire



Lighting business is part of construction industry

Summary



Lighting business is part of construction industry

Summary

Construction business

Lighting business

Key factors for our success:

- Only global players
 - have access to new technologies
 - have capabilities to develop new intelligent applications and standards
 - and can follow the complex changes in lighting business
- Our Sales Force meets all customers' requirements in a value-added lighting business

Sports
Street

End user

Light & ... leads to higher turn over and better margins
Energy & ... leads to refurbishment
Push and more intelligent products

Energy saving and comfort maintenance

Higher intelligence:
- Dimming
- Digital technology
- Bus-Interface

LED and OLED:
New lamps open the field or new competitors

