

## Barriers and possibilities for the emerging alternative lighting technologies

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# Barriers and possibilities for the emerging alternative lighting technologies

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## Problem area

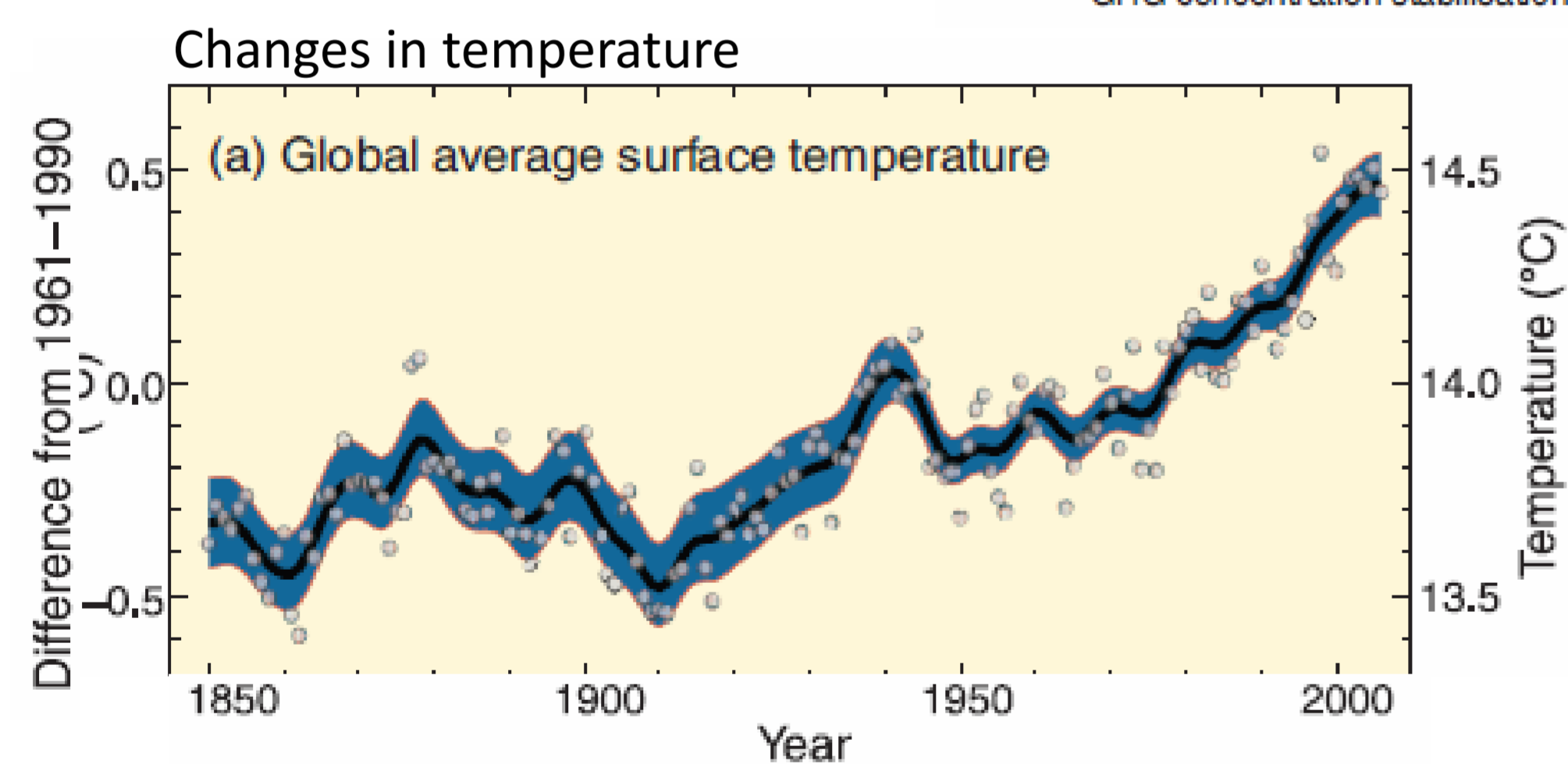
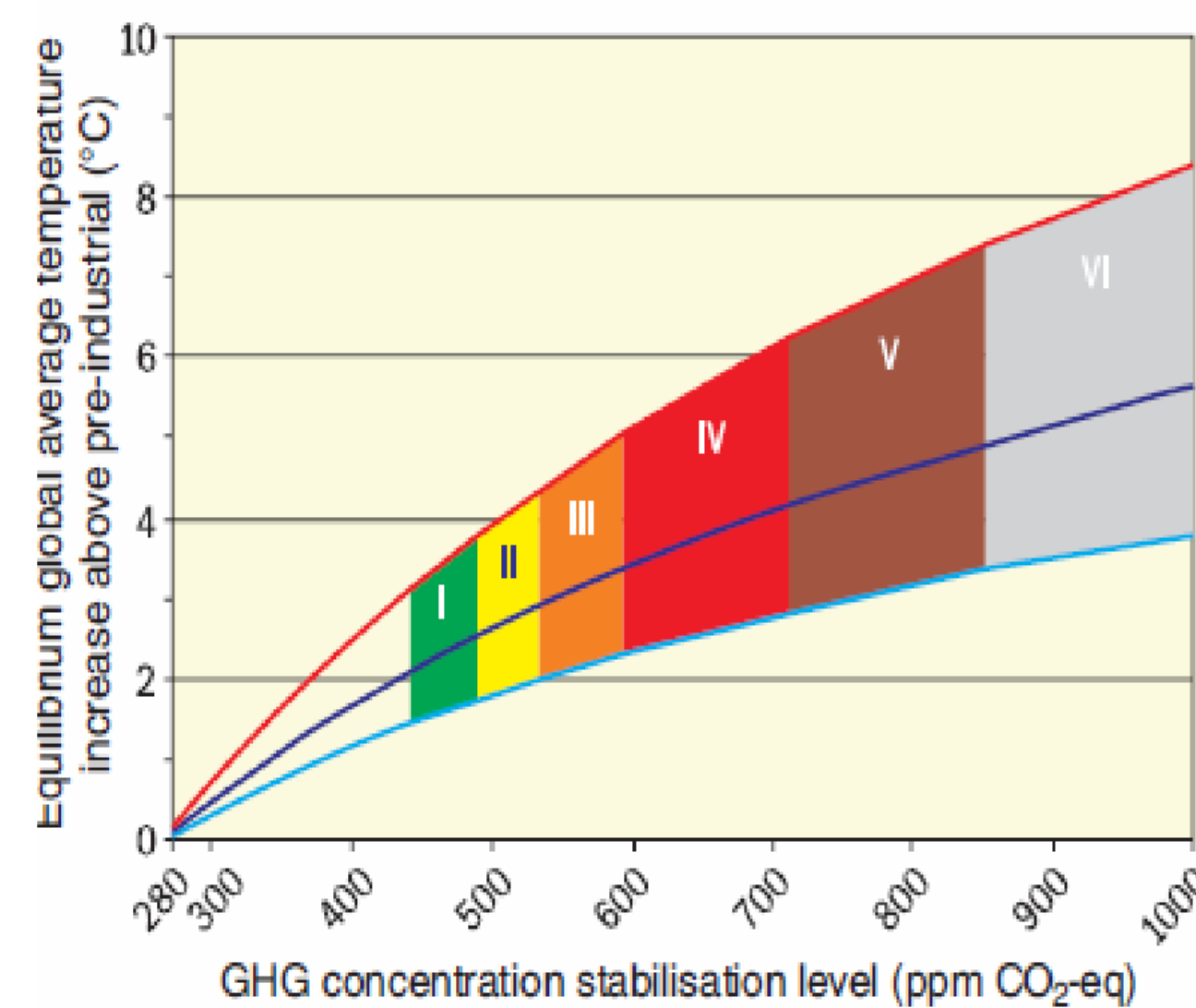
- Final electricity consumption across the EU-27 had an absolute increase of 28.7% between 1990 and 2005
- The average electricity use per capita is almost 2.5 times the global average and 3.5 times that for China
- 20% of the total electricity produced in the world is used for illumination
- Europe wastes at least 20% of the energy it uses
- This 20% of energy is equal to 780 million tonnes of CO<sub>2</sub> yearly
- 1.6 billion people doesn't have electric lighting yet, which represents a huge global market



Foto by: Araceli Bjarklev

## Climate challenge

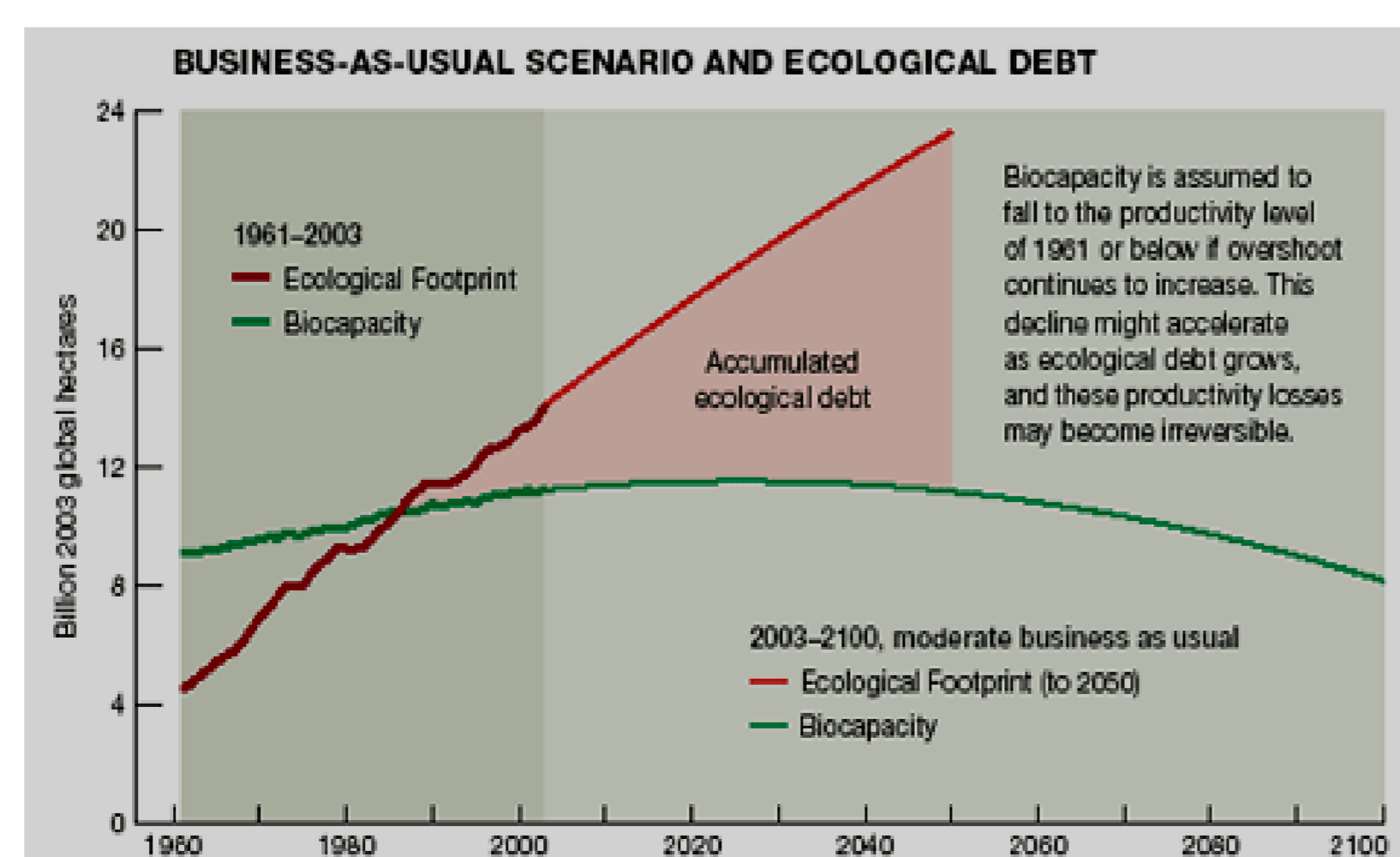
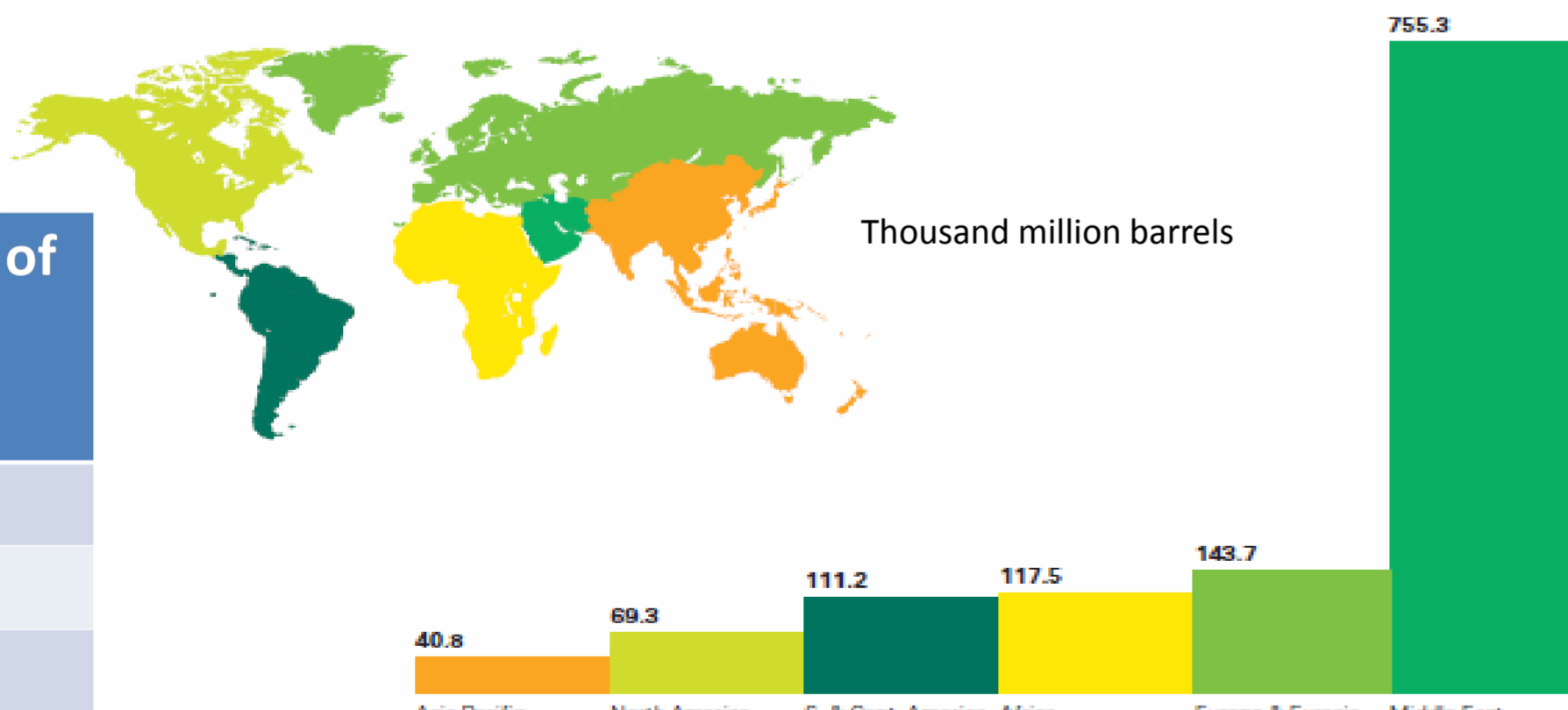
- Temperature raise should not exceed 2°C
- Global climate has already changed 0.7°C from pre-industrial times
- Concentrations of GHG not higher than 450 ppm
- GHG-emissions have to be reduced in an order of 50-85%



## Availability of resources

- Steep decline of the oil supply after peak in 2005
- Geographic distribution of other main resources problematic for self sufficiency

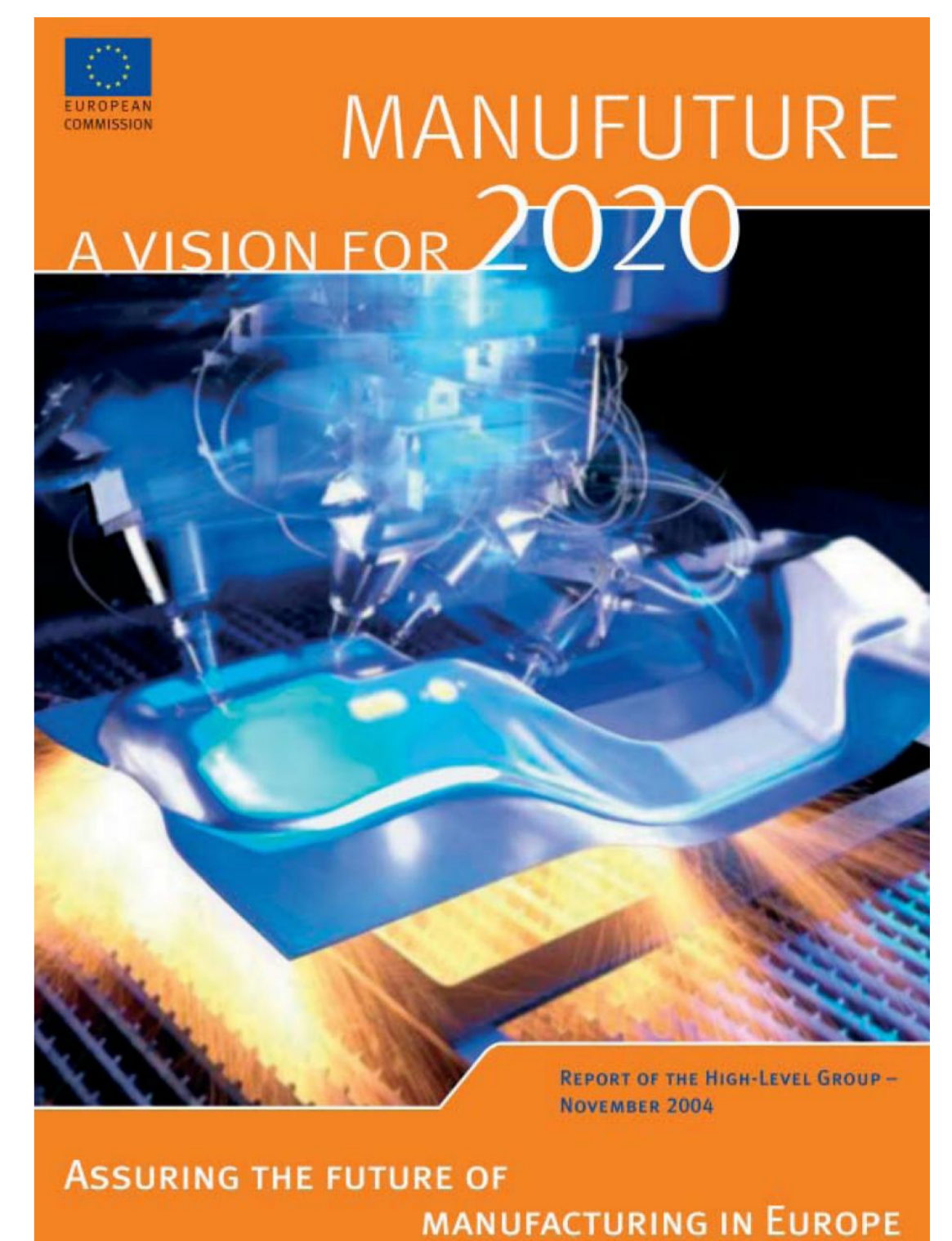
Resource	World's Reserves-to-production ratio (years)	EU-Share of world reserves
OIL	41.6	2%
Gas	63	3.5%
Coal	133	12.3%
Uranium	100	1.9%



- EU's ecological foot print continues rising despite the booming of energy saving devises

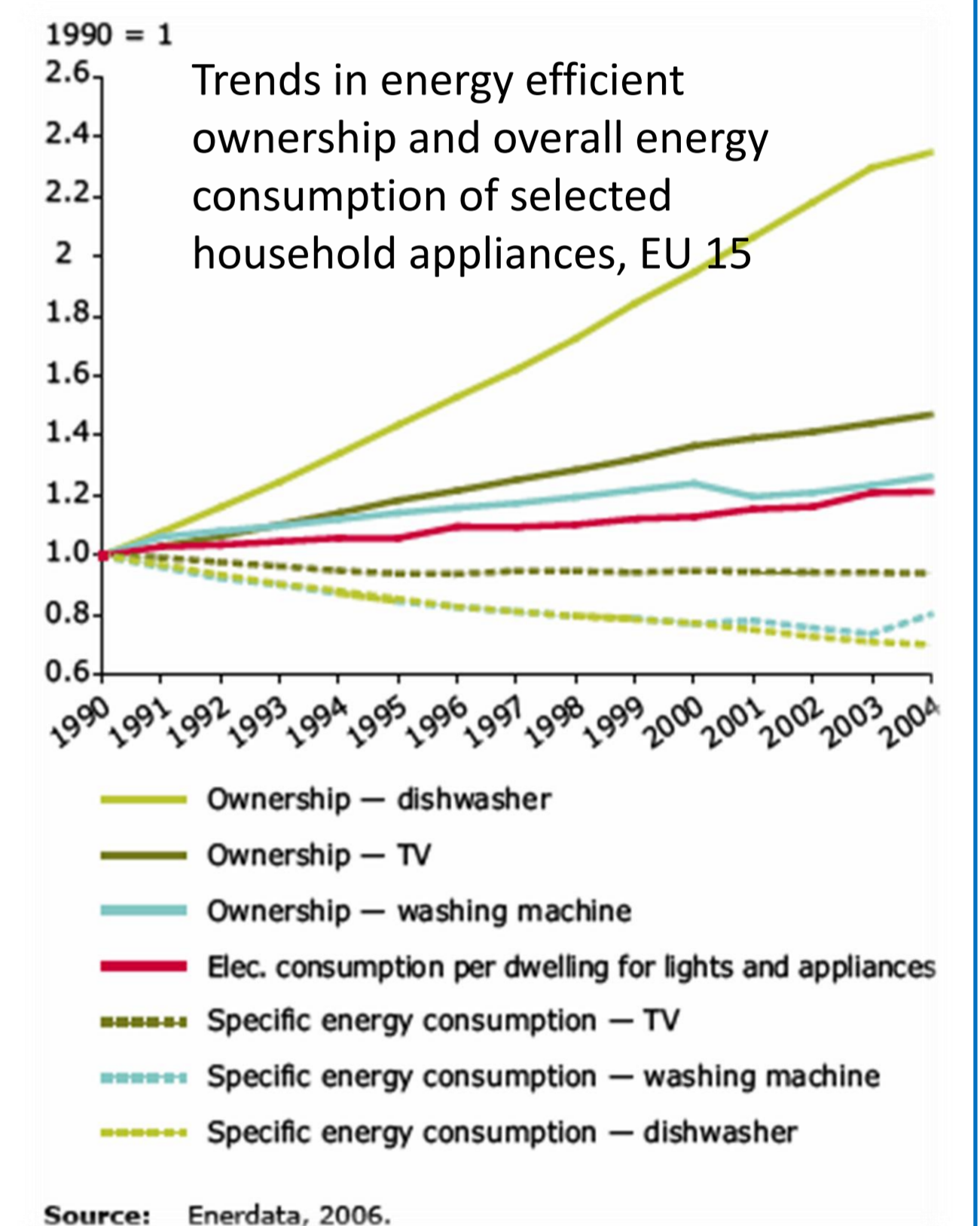
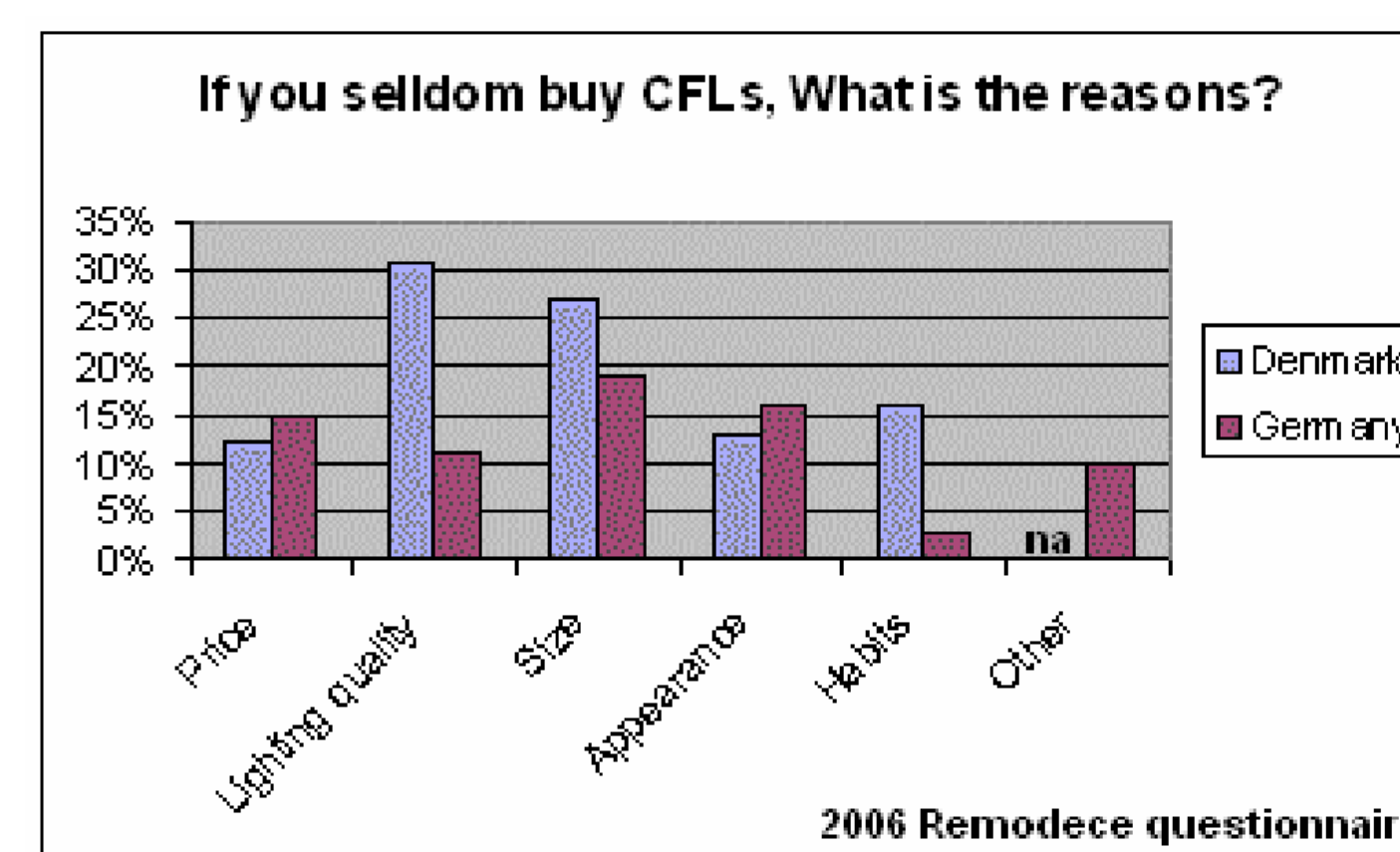
## Economic opportunity to boost the Community's innovativeness and competitiveness

- As indicated in the Lisbon Initiative the challenge of reducing CO<sub>2</sub> emissions also arises as an economic opportunity



## Consumer demand challenges

- Emerging lighting technologies have to provide *exceptional service* to be accepted in relation to their prices

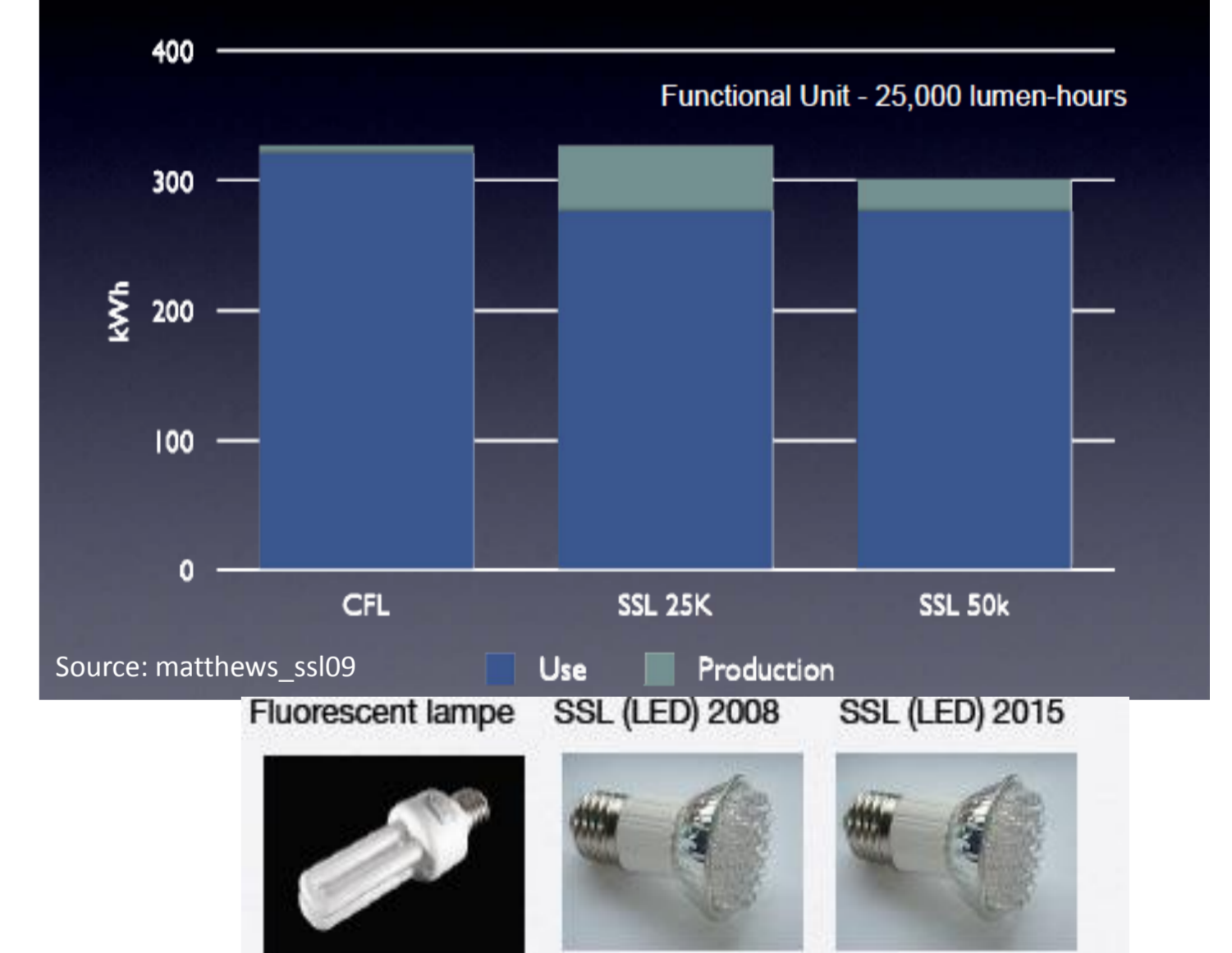


## Life cycle challenge

- Mercury is problematic according to RoHS directive and the Flower labelling
- Materials, chemicals and energy have to be assessed through the entire life cycle



## Life Cycle Energy Comparison of Lighting Technologies



## Conclusions

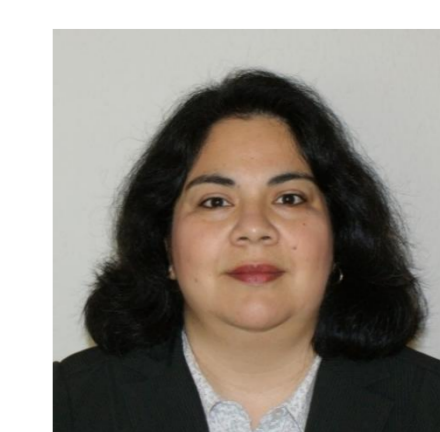
- Despite the possibilities, a sustainable strategy should consider:
- The challenge of reducing the ecological footprint (materials, toxic substances, emission of CO<sub>2</sub>, etc.) of current and future options
- The challenge of being cost competitive with the incandescent lamp in its life-cycle cost
- The challenge of making use of the current European photonic industry assets to enhance productive jobs
- The challenge of integrating the esthetical design combined with engineering and social disciplines
- A main challenge considering the already mentioned ones, is finding new methods to achieve a more holistic approach related to sustainable development of environmental technologies.



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