# 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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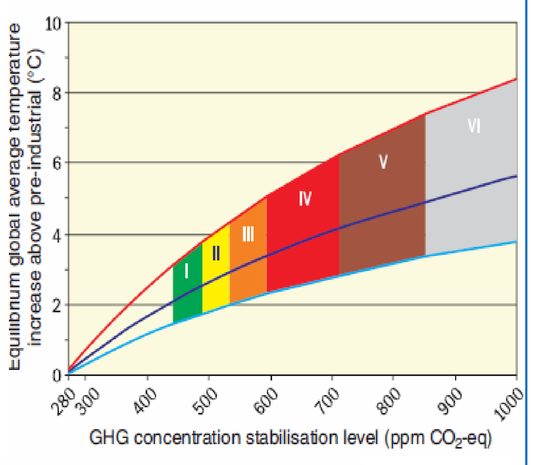
## Problem area

- 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 $CO_2$ yearly
- 1.6 billion people doesn't have electric lighting yet, which represents a huge global market

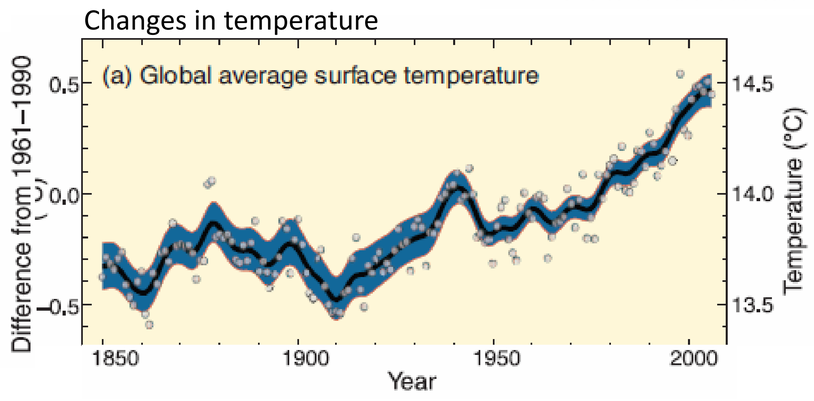
*Foto by: Araceli Bjarklev*

## Climate challenge

- Temperature raise should not exceed $2^0$C
- Global climate has already changed $0.7^0$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%



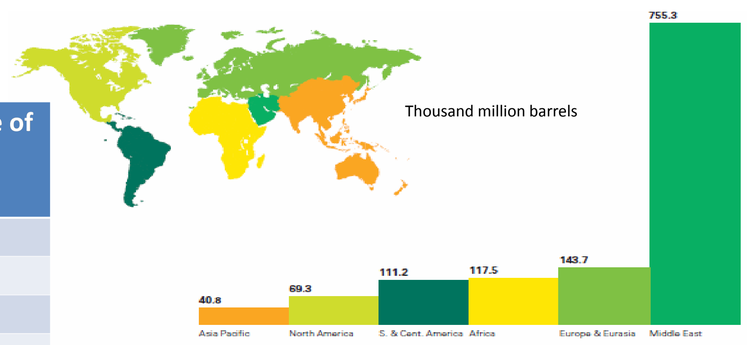

Changes in temperature



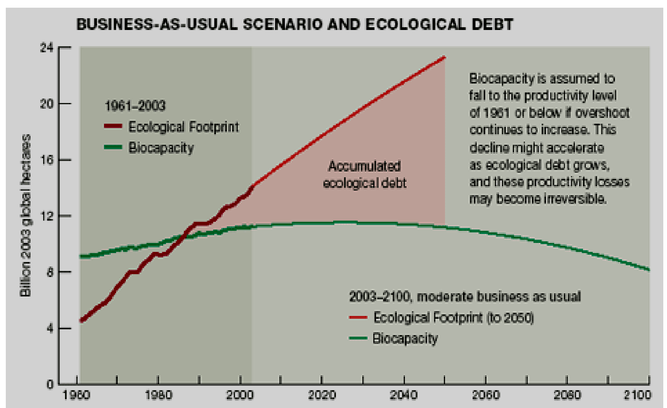

## Availability of resources

- 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% |

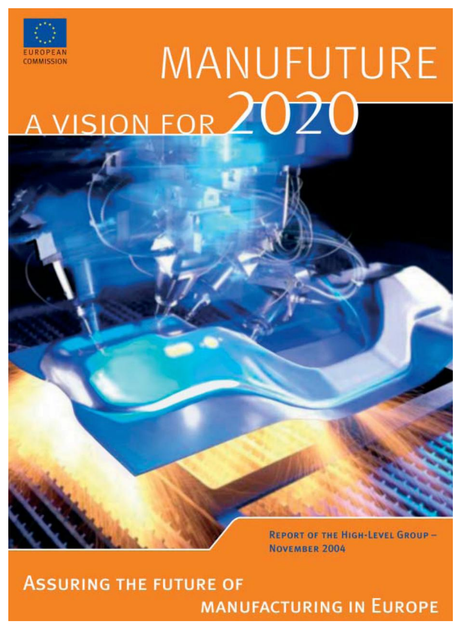



- EU's ecological foot print continues rising despite the booming of energy saving devises



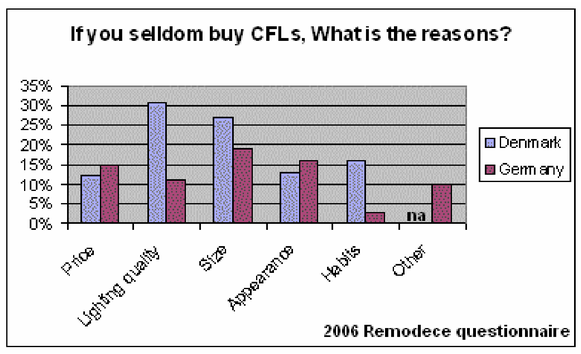

## Economic opportunity to boost the Community's innovativeness and competitiveness

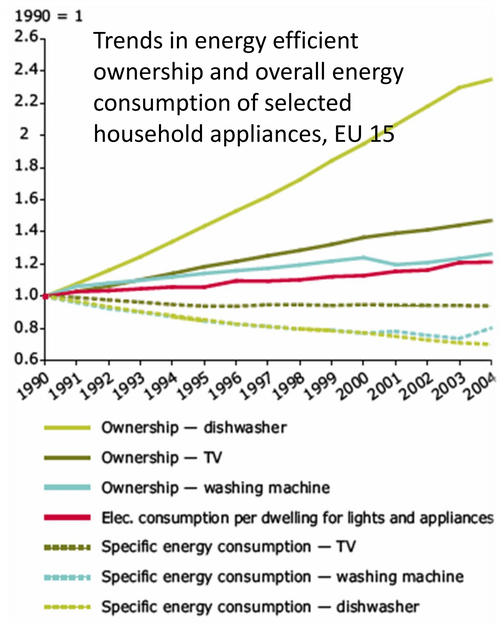
- As indicated in the Lisbon Initiative the challenge of reducing $CO_2$ emissions also arises as an economic opportunity




## Consumer demand challenges

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



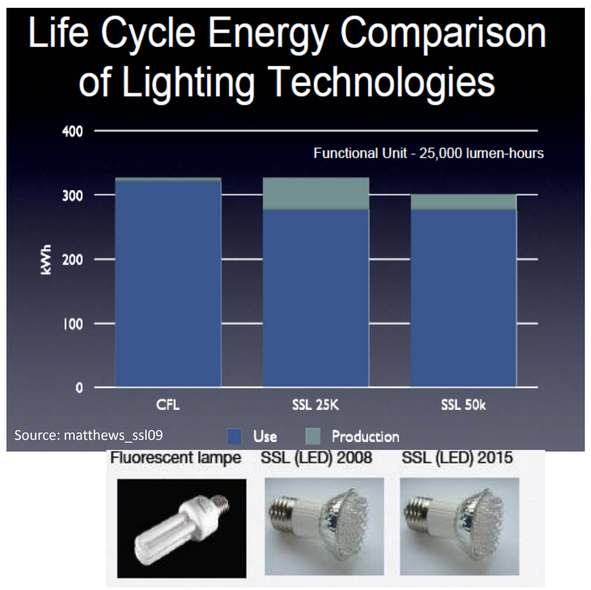




Trends in energy efficient ownership and overall energy consumption of selected household appliances, EU 15

**Source:** Enerdata, 2006.

## 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




## Conclusions

- Despite the possibilities, a sustainable strategy should consider:
- The challenge of reducing the ecological footprint (materials, toxic substances, emission of $CO_2$, 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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