

# Required Measures to Lock in CFL Quality

Presentation at IEA/EU/CEN-Star  
Trend-Analysis workshop  
26. Feb. 2007

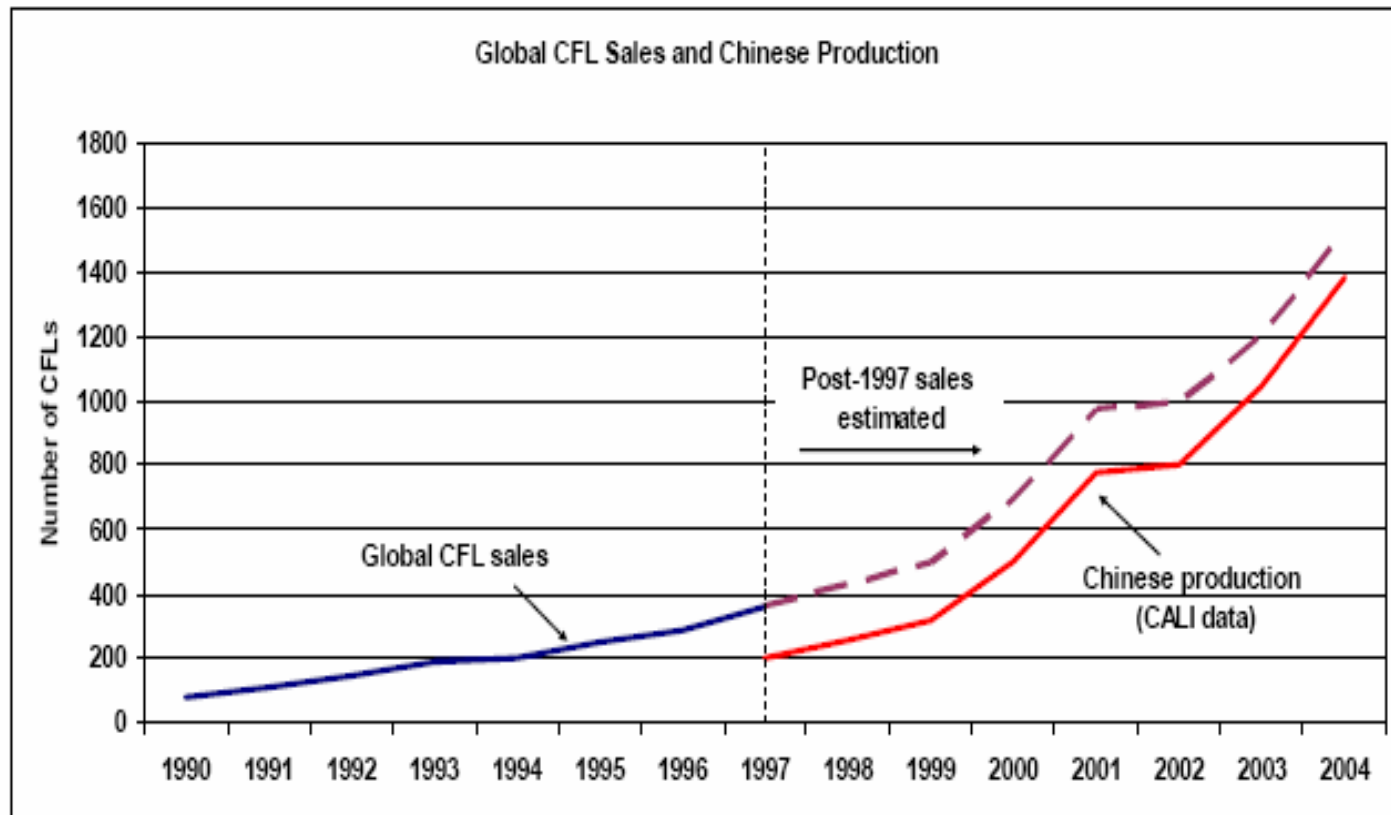
Casper Kofod, Energy piano



# Agenda

- 1. CFLs - Are we doing good?**
- 2. What are we going to phase out?**
- 3. What are the barriers today?**
- 4. Required improvements of the Quality Charter**
- 5. LED – the lighting of the future?**

# Global CFL Sales



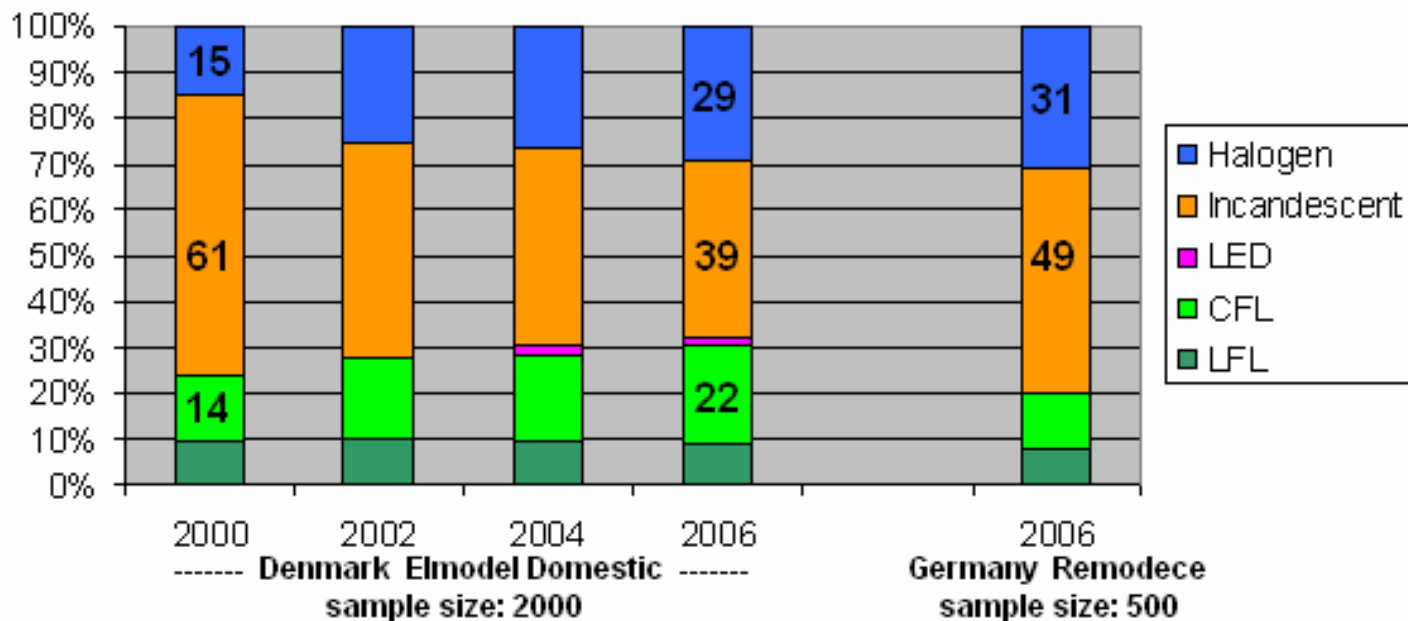
Source: International Association for Energy Efficient Lighting for pre-1997 sales; China Association of Lighting Industries for post-1997 production

# 1.000.000 CFLs Sales in Vietnam

- International tender 2004 (WB supported DSM program 2004-2007)
- ELI specifications (min 6.000 h lifetime)
- ONLY 15 W CFL
- First contract 300.000 CFLs from Osram at a price of US\$ 1,07 per CFL
- No need for subsidy payment from EVN
- 2006 new tender -> OSRAM 1 US\$/CFL

# What are we going to phase out?

**Lamp type distribution for Denmark and Germany**



3,1 CFLs

61% homes with CFL

5.1 CFL/home with CFL

5,1 CFLs

84%

6.1

3,1 CFLs

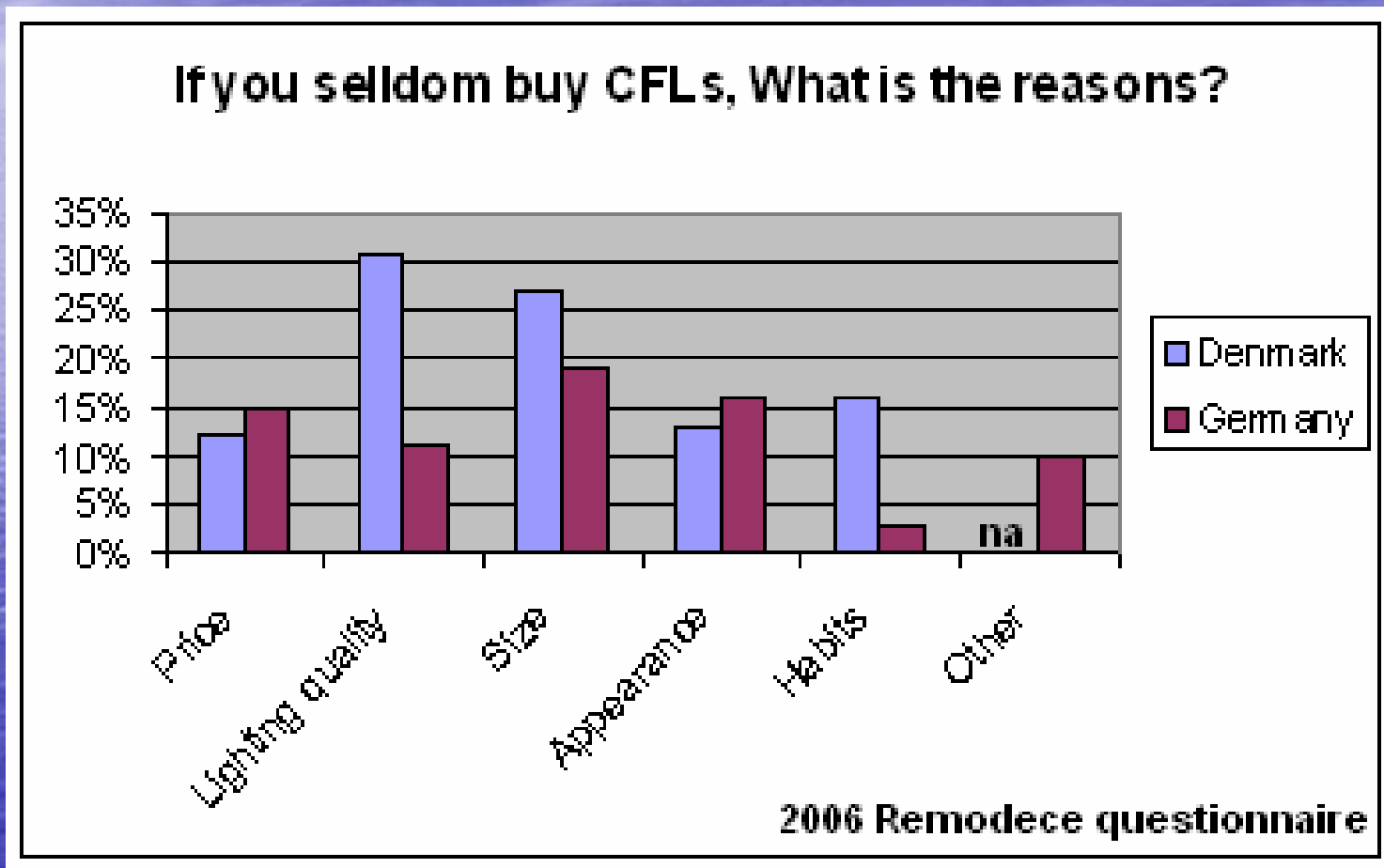
**SA/21/94/DK Market Research on the Use of Energy Saving Lamps in the Domestic Sector (1996):**

**Economical potential: 11 CFLs Market potential: 6 CFLs**

# CFL Barriers

- Bad experience with first generation
- Poor quality
- Do not fit – lack of dedicated luminaires
- Visual appearance – “not good lighting”
- Colour and colour rendering
- Lack of CFLs with dimming in the shops
- Warm up time
- Price

# Barriers for buying CFL's



# Quality 1: CFL life hours

- From 1980'ties utility CFL campaigns. Consumer complaints.
- In 1991 IEC pub. 969 life test: 2 h 45 min ON / 15 min OFF. 50% of the CFL able to manage 3000 ignitions
- In 1995 additional test: 3 min ON / 5 min OFF and 20,000 ignitions. 1996 test results: 22 products survived 100%, 11 products 50-95% and 15% only 0-45% survived.
- Positive list customer guidance, included 70 products in 1998
- 1999 Quality C. : 0.5 min ON / 4.5 min OFF, cycles doubles of h. life. Test required from manufactures => Danish utilities stop.
- In 2000 many customer complaints => Energy Saving Trust starts testing. Result: Only 30-40 products of quality!
- Test samples (quantity 20) every year, A Lamp quality list (now incl. 150). 2006 results: some products fails after 5,000 ignitions.
- 2003 rev. Quality Charter, 5 min ON/ 10 min OFF, cycles = h life testing for CFL with 10,000 hours life takes 105 days.



**Danish proposal: 5 min ON/ 5 min OFF, 70 days test period.**

# Quality 2: Lumen, start up, CRI

- 1999 Quality Charter: After 2000 hours not less than 88% of the initial luminous flux.
- 2005 rev. Quality Charter: Lower requirements of less than 83% for CFLs with external casing (look-a-like CFLs)
- 60% light output within less than 1 minute
- CRI > 80



Photo: Energy piano


# Customer Complain

*" CFLs don't give good lighting"*

= CFLs do not give ENOUGH lighting

- \* Start up time
- \* Wrong info about equivalence

# Quality 3: CFL/GLS equivalance



**EUROPEAN CFL QUALITY CHARTER**

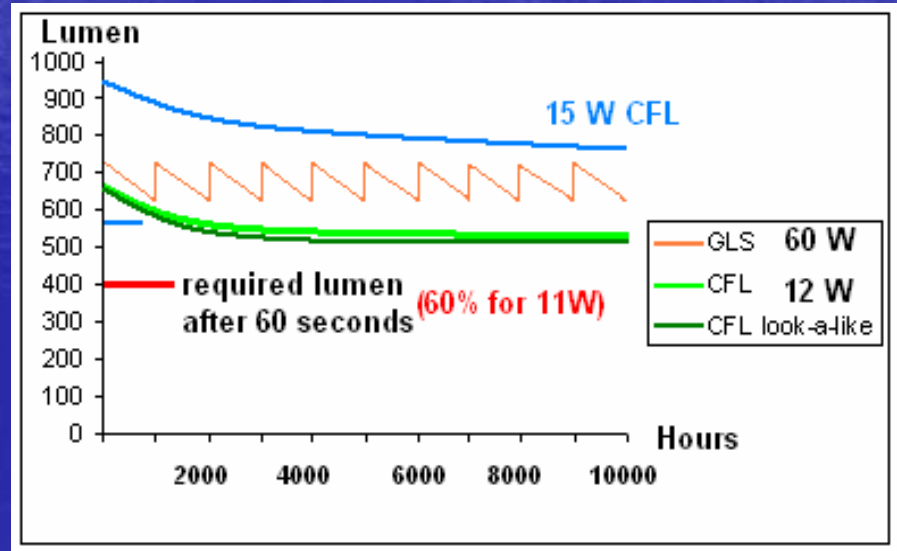
CFL lumen (lm)	initial claim	Rated Wattage(s) of the GLS filament lamp for which equivalent is claimed (W)
<del>≥ 214</del>	<del>≤</del>	<del>25</del>
<del>≥ 386</del>	<del>≤</del>	<del>40</del>
<del>≥ 660</del>	<del>≤</del>	<del>60</del>
<del>≥ 874</del>	<del>≤</del>	<del>75</del>
<del>≥ 1246</del>	<del>≤</del>	<del>100</del>
<del>≥ 2009</del>	<del>≤</del>	<del>150</del>

**Bad Quality!**

Light output (lm)	Power of standard GLS (W)
≥230	25
≥415	40
≥570	50
≥715	60
≥940	75
≥1,227	90
≥1,350	100
≥2,180	150
≥3,090	200

**ELI Efficient Lighting Initiative 2006**

Im GLS  
720  
960



Denmark + Sweden  
have recommended  
4:1 for 10 years

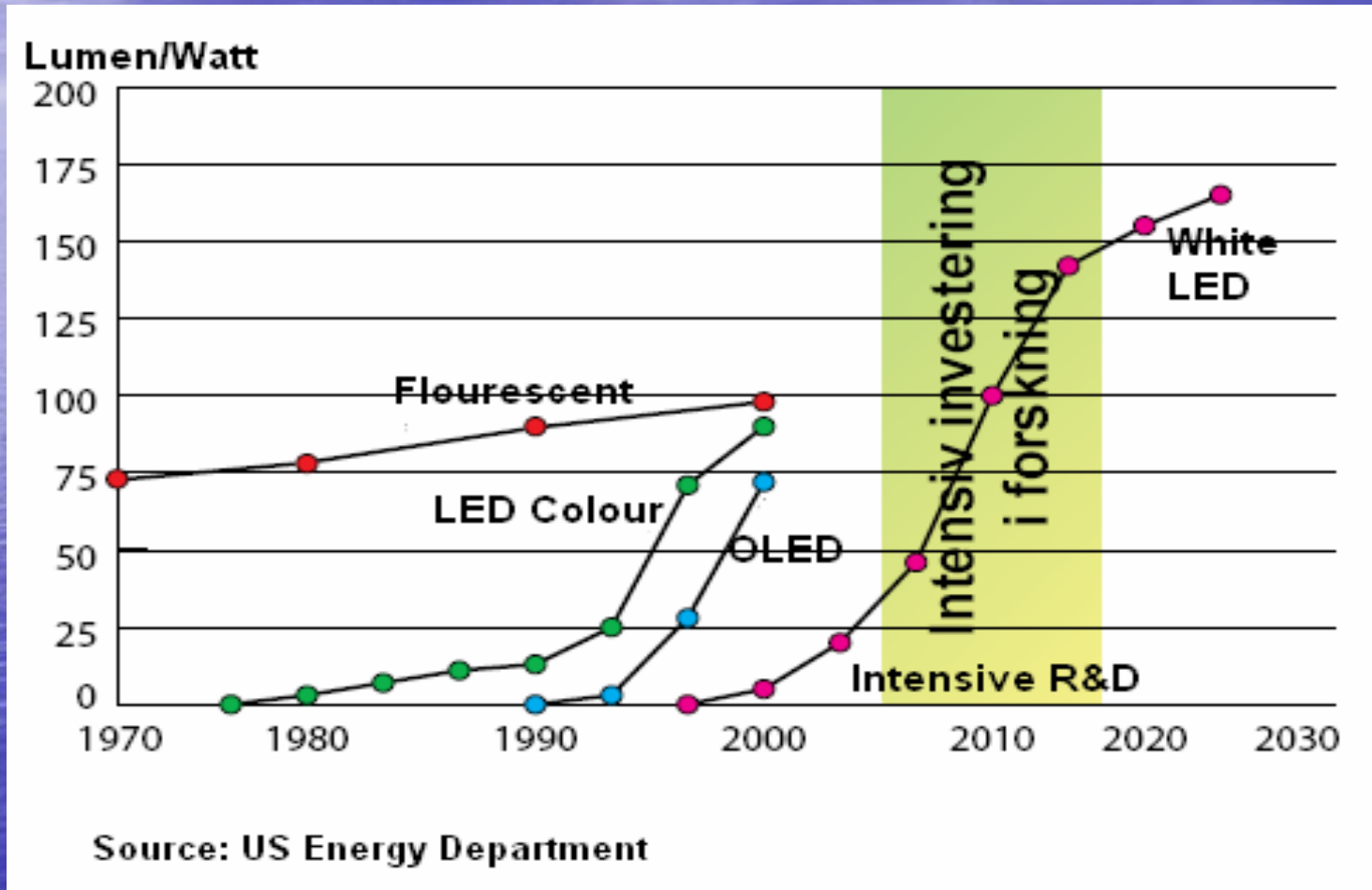
**Proposal: 4:1 e.g. 60W GLS = 15 W CFL**

# LED Lighting



Glasgow Bridge, LED lighting, Photo: Philips

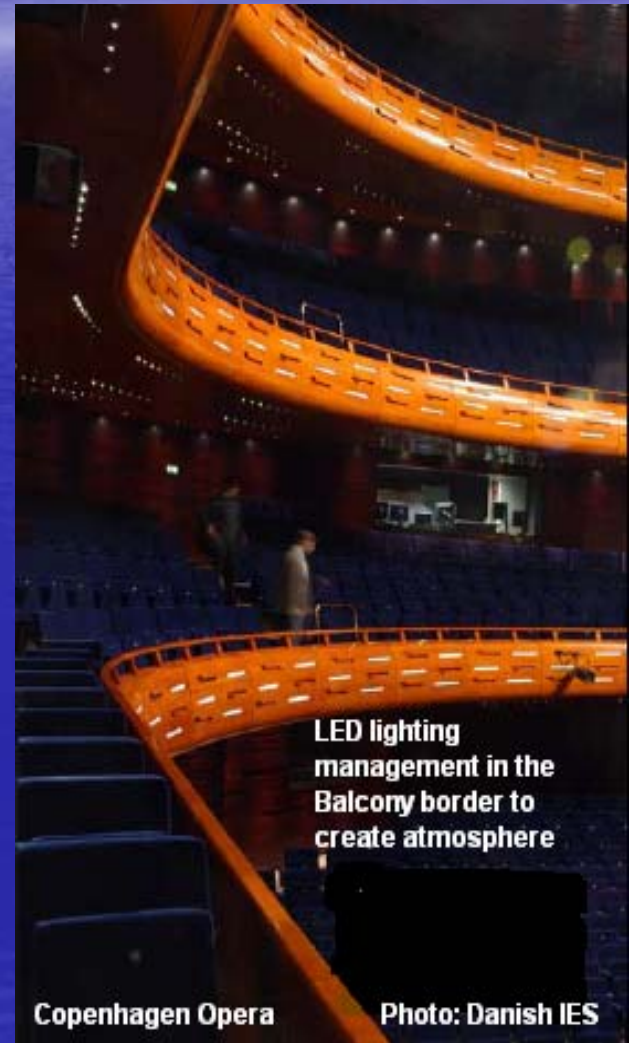
# Development – Efficiency



In Case of 100 lm/W, US saving potential equal to 29 power plants

# LED Benefits

- Energy efficiency
- Robust and small
- 50.000 hours lifetime
- Full lumen instantaneous
- Dimming - No colour change
- They contain no mercury
- They work when it is cold



# LED costs



- At present, 1000 lm from LED cost around 100 times the price for incandescent lighting
- LED live 50 times longer than incandescent lamps (50.000 hours versus 1.000 hours)
- No costs of replacing lamps for LED
- LED prices reduction 20% every year during the last 2-3 years

Thank you  
for  
your attention!

