Shaping the future of Light

Martin Goetzeler, CEO OSRAM
June 2010

OSRAM

OSRAM - Part of the Industry Sector of Siemens

Siemens is a global powerhouse in electronics and electrical engineering, operating in the industry, energy and healthcare sectors.

Industry

- Drive Technologies
- Industry Automation
- Building Technologies
- Mobility
- **Lighting (OSRAM)**
- Industry Solutions

Energy

- Fossil Power Generation
- Renewable Energy
- Oil & Gas
- Energy Service
- Power Transmission
- Power Distribution

Healthcare

- Imaging & IT
- Workflow & Solutions
- Diagnostics

Industry Automation	Drive Technologies	Industry Solutions	Building Technologies	OSRAM	Mobility
					

OSRAM at a Glance*

- OSRAM: one of the world's two leading lighting manufacturers (headquarters: Munich)
- Trademark registration: on April 17, 1906 at the then Imperial Patent Office in Berlin
- Founded on July 1, 1919 by the merger of the incandescent lamp manufacturing activities of AEG, Siemens & Halske AG and Deutsche Gasglühlicht-Anstalt (Auer-Gesellschaft)

The art project SEVEN SCREENS at OSRAM headquarters in Munich – a project developed in cooperation with OSRAM Light Consulting - shows that the OSRAM brand is 104 years young. 700,000 high-power RGB LEDs (16 mio different colours possible) have been installed on the masts and can be controlled via fibre optic cable from a central computer room.

Employees: More than 39,000	Production: 46 factories in 17 countries	Turnover: EUR 4.0 billion	R&D: 6.6 % of sales

*Status: FY2009

OSRAM Products

Professional Lighting

Lamps, Ballasts & Luminaires (LBL)

- Fluorescent lamps
- Compact Fluorescent lamps (CFLpin)
- High-intensive discharge lamps
- Electronic control for (compact) fluorescent lamps, low-voltage halogen lamps
- Traditional (non LED) Luminaires

Light Management System (LMS)

- E. g. DALI or DMX control solutions

Solid State Lighting (SSL)

- LED Key Components
- LED Luminaires for Mass Markets
- Architainment Projects (JV with Traxon)

Consumer Lighting

Consumer Lighting (CL)

- Halogen lamps
- Compact Fluorescent lamps (CFLi)
- LED Retrofit
- Standard incandescent lamps

Opto Semiconductors

Opto Semiconductors (OS)

- LED components
- OLED
- High-power laser diodes
- Infrared components

Specialty Lighting

Automotive Lighting (AM)

- LED, halogen and Xenon headlamps
- Auxiliary lamps (inc LED)
- Headlight systems (North America only)

Display/Optic (DO)

Lighting sources for display applications, LED, halogen and discharge lamps for film and television, effect and airport lighting, medicine and microscopy.

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Siemens UK at a glance

Development in UK

- **Siemens Employees = 16,000**
- **UK Turnover £4.1billion**
- **Over 160 years of business in the UK**
- First ever water meter (1852)
- London-Calcutta telegraph link (1869)
- Laid first submarine cable to link Britain and the USA (1873)
- First ever electric street lighting (1881)
- First electric lighting in a British theatre – Savoy Theatre, London (1881)
- Joint venture building offshore wind farm Gwynt y Môr - Siemens share worth 1.2 billion Euros (2010)

OSRAM UK at a glance

Development in UK

- **OSRAM brand in UK for over 90 years**

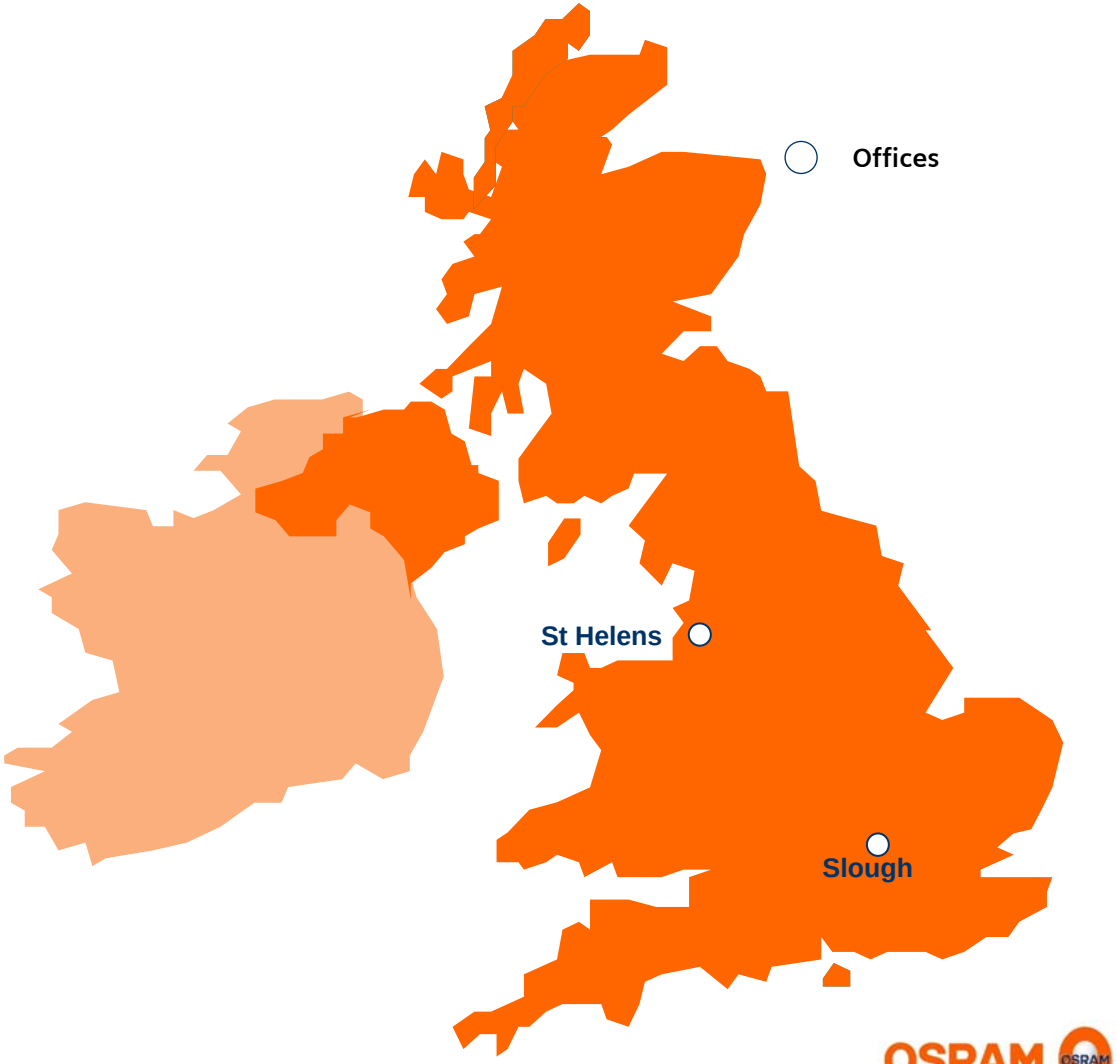
- **Today: sales and marketing focus supporting UK and Irish markets.**

- **OSRAM UK Employees = 100**

- 20% of professional lighting in UK is from OSRAM

- 50% of all cars in the UK have OSRAM lights fitted

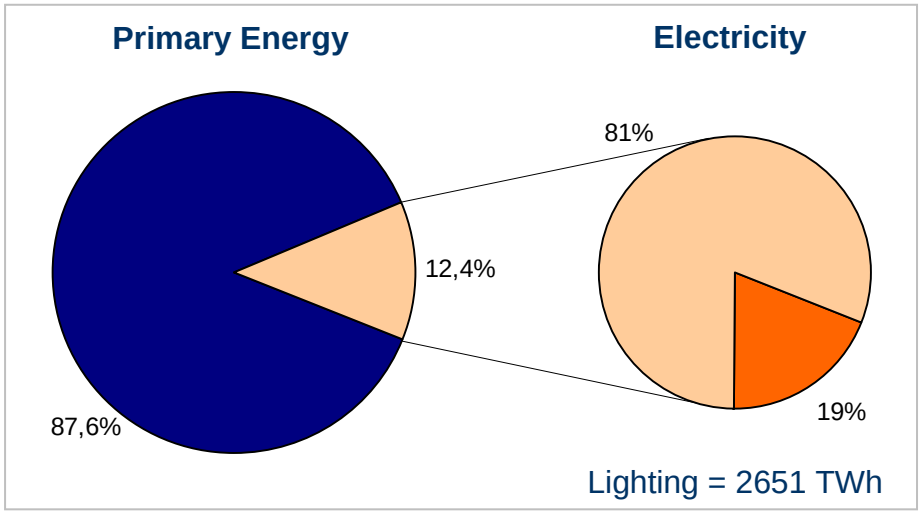
- 9 out of 10 cinemas use OSRAM light for film projection

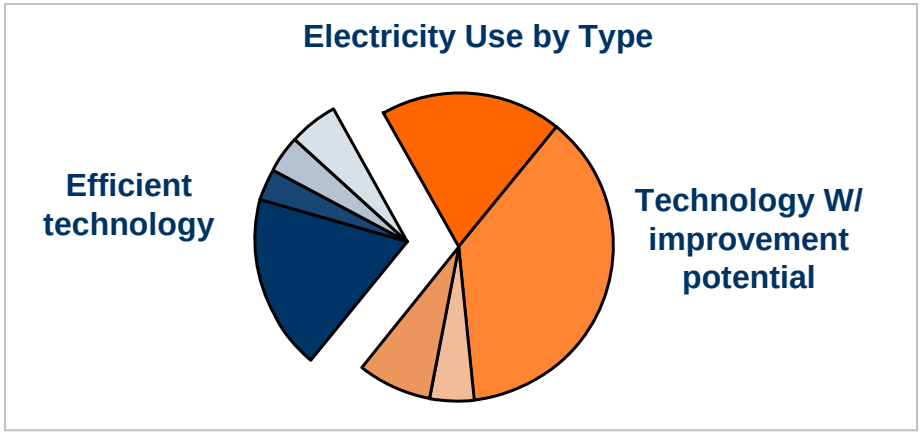


The Impact of Lighting on a Global Scale

Lighting consumes a significant amount of energy

- Lighting accounts for **19%** of the global electricity consumption
- 2651 TWh were used globally for lighting in 2005 ~ **8 times the electricity consumption of UK**
- Nearly **70%** of the electricity is used by lighting for which a **better alternative** is available





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The Impact of Lighting on a Global Scale

The savings potential of efficient lighting is enormous

- It would be technically feasible **to save nearly 2/3** of the electricity used for lighting
- Realistically **50% of the electricity could be saved – over 1300 billion kWh**
- Thus 650 million tons of CO_2 would not be emitted into the atmosphere* - an effect similar to **planting a new forest nearly 3 times as big as Great Britain**

* At average Energy-Mix: 0.5 kg CO_2/kWh

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London – A Megacity

- 50% of the world's population live in urban cities
- Cities consume 75% of the world's total energy and generate 80% of the world's greenhouse gases
- Despite the efforts based on the Kyoto Protocol **75% of UK buildings use 25 year old lighting technology***
- Adoption of efficient lighting could save London **1.4million tons of CO_2 per year****

*Lighting Industry Federation (UK)
**McKinsey & Company City research study (2008)

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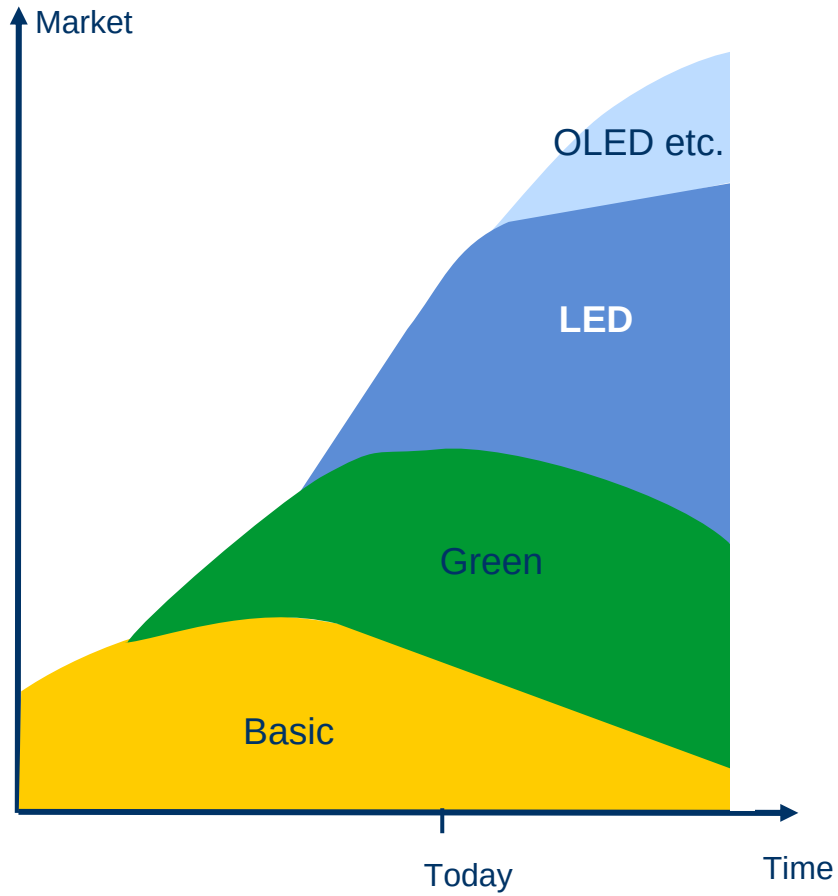
OSRAM is leading the technology transition

Classic versus SSL/LED**



Overall lighting market trend

General:

- The overall lighting market had a size of EUR 22 bn in 2008
- Increase in LED share from EUR 4.6 bn in 2008 to EUR 12.6 bn by 2012*

Classic products:

- Standard technologies in decline for years
- Energy-efficient, high-quality products driving growth
- CO2 reduction results in ecological and economic win/win situation

SSL / LED:

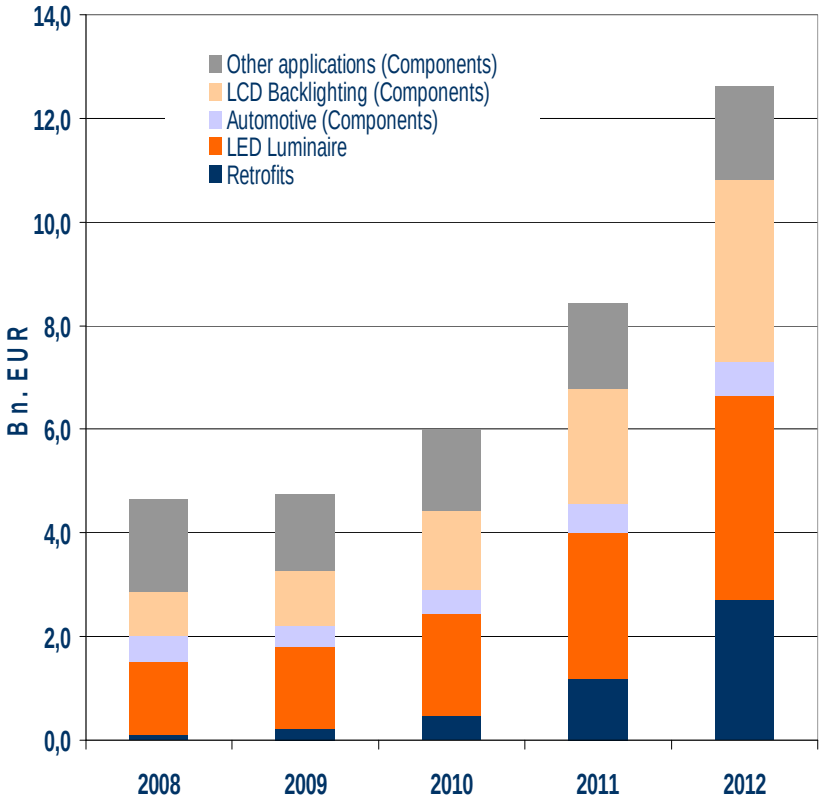
- Future technologies open up new applications and markets
- LED/OLED growth driven by energy-efficiency and new characteristics

*Data basis: Strategies Unlimited, September 2009

**schematic

Explosive market development

LED market and addressed fields of application *



Trends

General lighting:

- Retrofits lead the way in gaining fast market access, driven e.g. by national regulations
- Professional applications e.g. architectural lighting, tunnels and street lighting on the way
- In the medium term, commercial applications (shop, office) will be the largest segment

Automobile headlights:

- Growth driven by front lighting and daytime running lights

LCD backlighting:

- Most important LED application in the short term

*Data basis: Strategies Unlimited, September 2009

Environment and consumers benefit

Lifecycle analysis in primary energy

*Less than 2% of the energy used is for production

OSRAM LED study

- **LEDs are just as environmentally-friendly as energy-savers**, and are clearly ahead of conventional light bulbs in terms of their ecological impact
- Thanks to its profound LED-Portfolio, OSRAM will increase energy savings in connection with classic technology to 60%
- OSRAM aims to increase its share of sales with green products from **66 to 80% in the next few years**

Innovation as a driver for profitable growth

Quiosques de Copacabana, Rio de Janeiro, RJ

- Research & development expenditure 2009:
  - 6.6 % of sales
  - 18 % of sales in opto semiconductors
- As trendsetter we are **driving the technology transition** to SSL
- SSL sales are **18% of overall sales**
- Today close to **50% of R&D for SSL**

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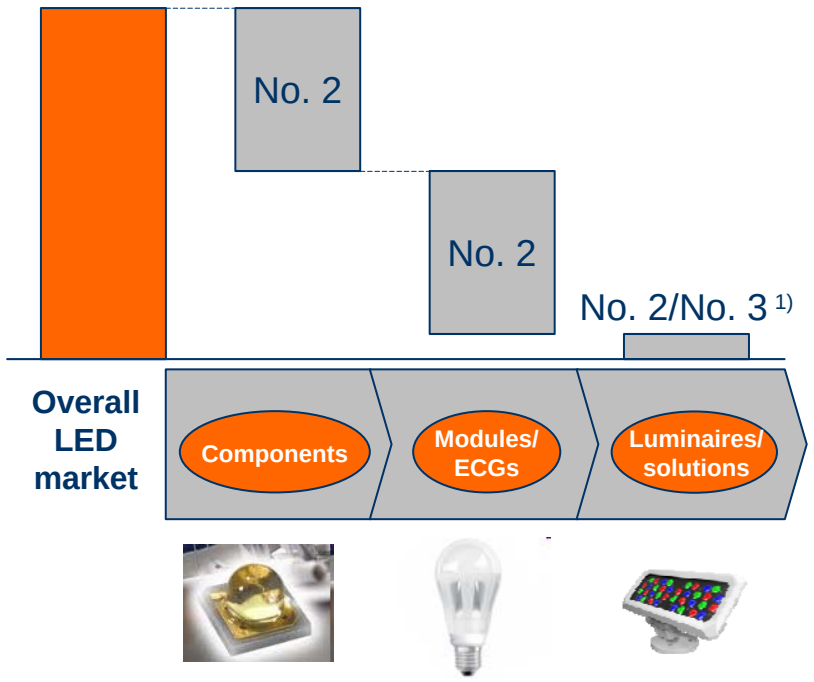
Integrated offer of products, systems and solutions

LED value chain



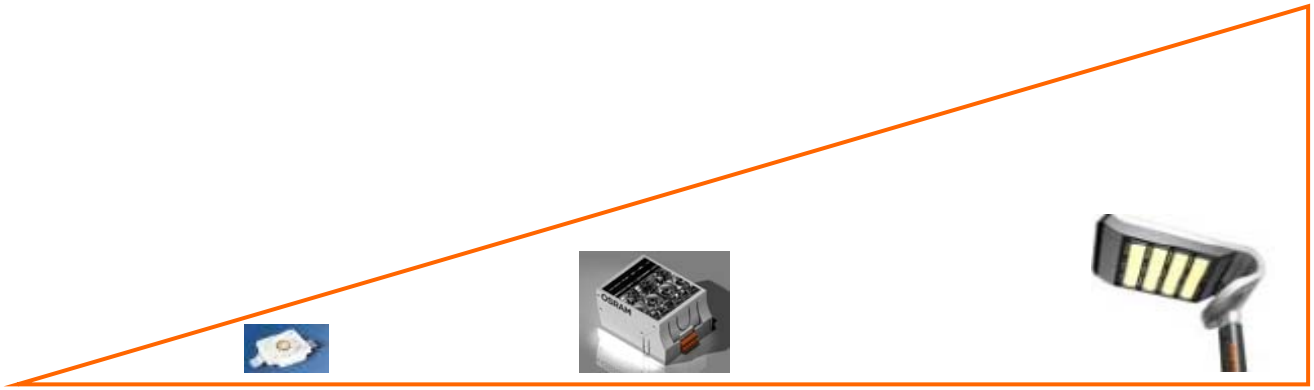
OSRAM positioning

- OSRAM is driving the change to SSL throughout the value chain
- Integrated offer makes OSRAM preferred supplier of its customers
- Exploit strength in innovation and expand patent portfolio
- OSRAM continuously develops light management and light quality

1) In defined applications

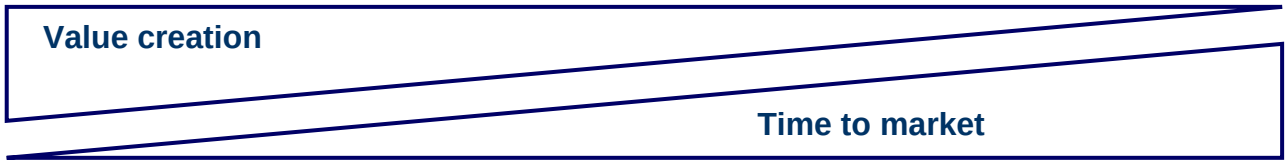
Integrated portfolio offers options for the customer

LED | Optics | Electronics | Heat sink | IP protection | Housing / holder | **Luminaire/ solution**



OSRAM components — modules — solution

Customer perspective



Customer choice:

- Faster market entry, lower value creation

Vs.

- Higher value creation and slower time to market

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Components: OSRAM is no. 2 on the world market

Automotive

AUDI

Backlighting

Mobile

LED LCD

Industry

3GM pocket beamer

General lighting

OSRAM Helix luminare

Av. Beira Mar, Florianópolis, SC

Street lighting

LEDs in Street Lighting

OSRAM Golden DRAGON Plus

OSRAM STREETlight Advanced

OSRAM STREETlight Protect (HPML)

Luminaire with single LED / Luminaire with 4 modules

Lighting, guiding and safety

OSRAM know-how:

- Graduated product portfolio with varying times-to-market and depth of value creation

Customer benefits:

- High level of energy efficiency
- x3 increase in lifetime and less maintenance work
- Further savings due to intelligent activation and dimming
- Directed light increases sense of security
- **>600,000 streetlights in London**
- **London energy saving potential: 33,000 kW**

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Traxon Technologies – an OSRAM company

A global leader in dynamic solid state lighting.

- **Innovative customised LED lighting solutions**
- **Markets:**
  - Professional architectural,
  - shop display,
  - hospitality,
  - entertainment
- **Over 3000 installations worldwide** e.g.
  - London Tower Bridge
  - Guggenheim Museum,
  - Lisboa Hotel (Macao, China)
- **Award-winning products and solutions** (e.g. iF Design Award, Popai, Innovation Award, IE Award)

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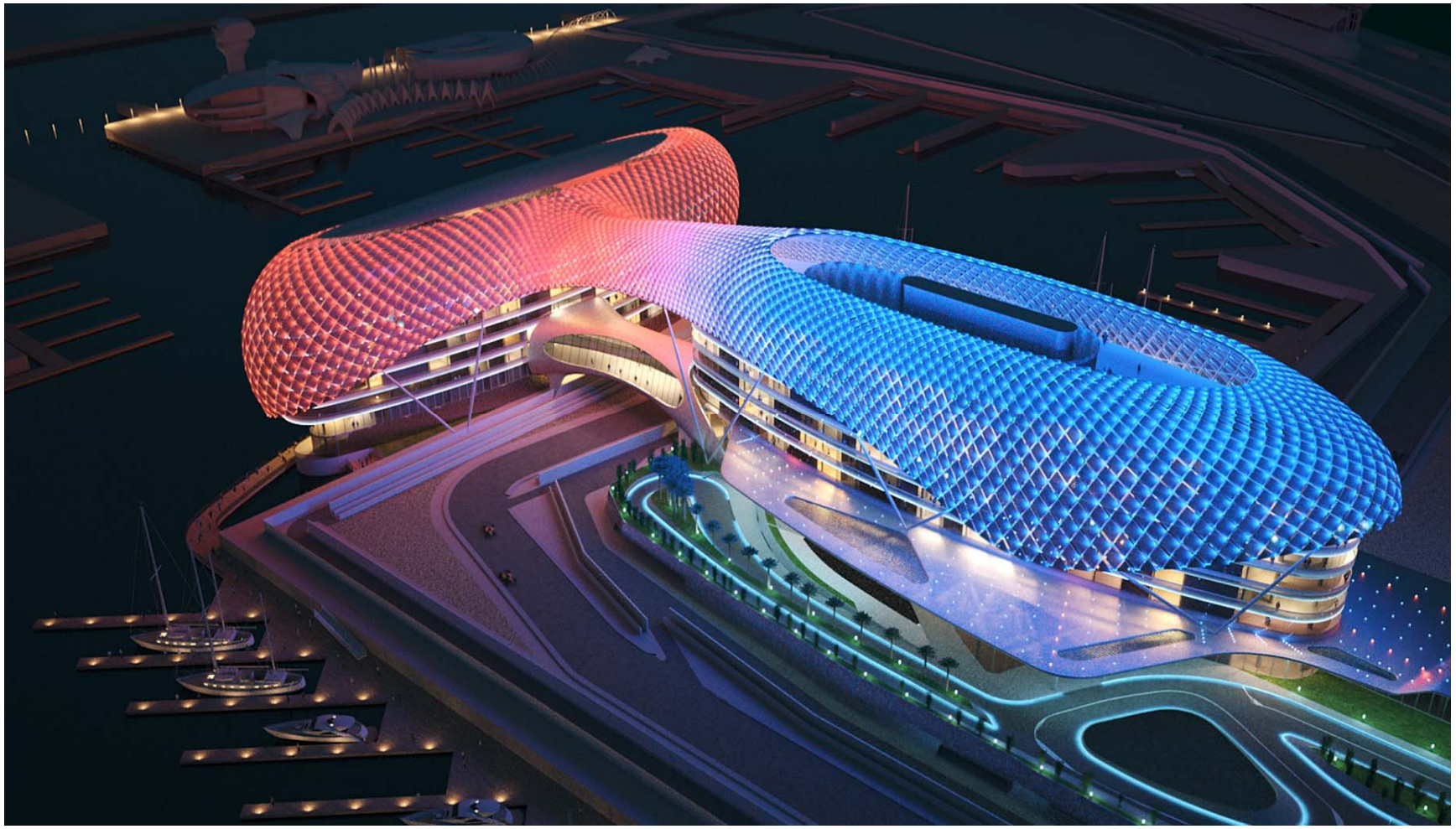
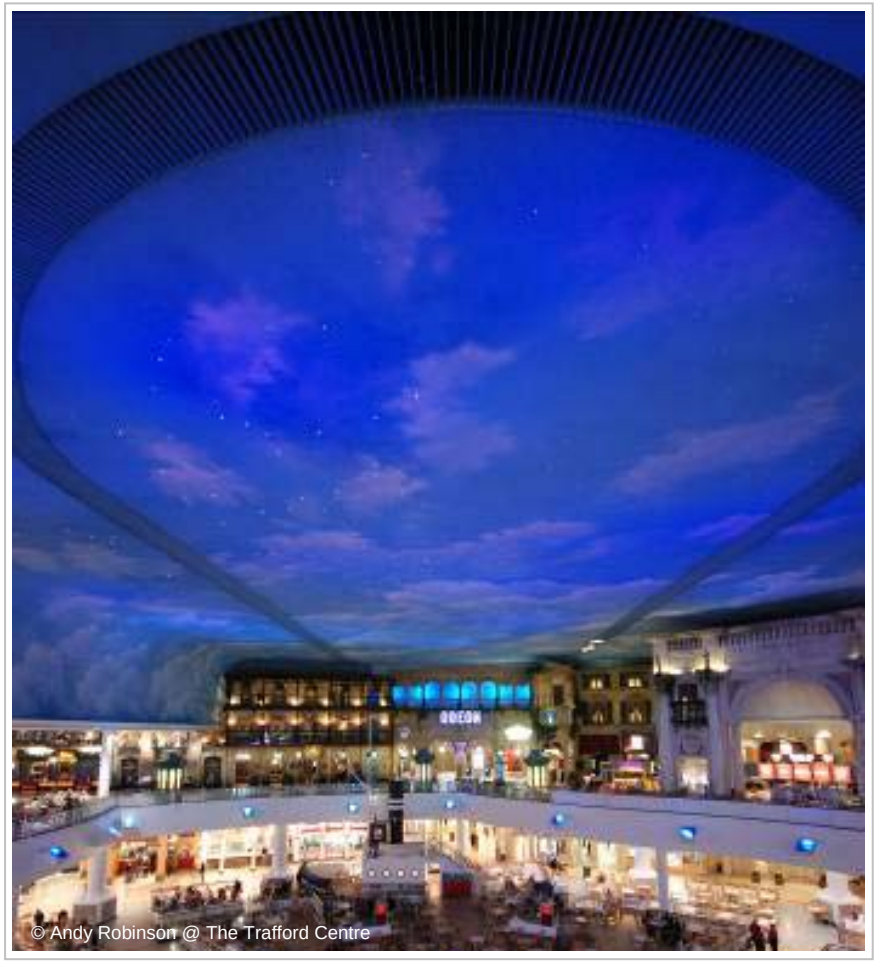
OSRAM & Traxon:
Controlling the Light at the YAS hotel, Abu Dhabi



OSRAM:
Lighting the stadia in South Africa.

UK References:
The Trafford Centre, Manchester



- Existing oil-wheel based 700W fittings were obsolete, as well as being expensive to maintain and run

- **OSRAM HIGH POWER LED FLOOD** were installed = energy savings **of approx 90% along with considerable maintenance savings**

- Power consumption reduced to **1.5 kW, compared to 18.2 kW**

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UK References:
Novotel Hotel, Heathrow

- OSRAM's RGB LED luminaires create a **unique and flexible external lighting scheme** replacing traditional halogen based lighting
- Each OSRAM RGB luminaire features 36 high-power **GOLDEN DRAGON® LEDs**
- Energy consumption reduced from 300W to 55W in each luminaire
- Novotel achieved savings externally of 5.3kW hour per hotel = potential **energy savings across UK group: £66k**

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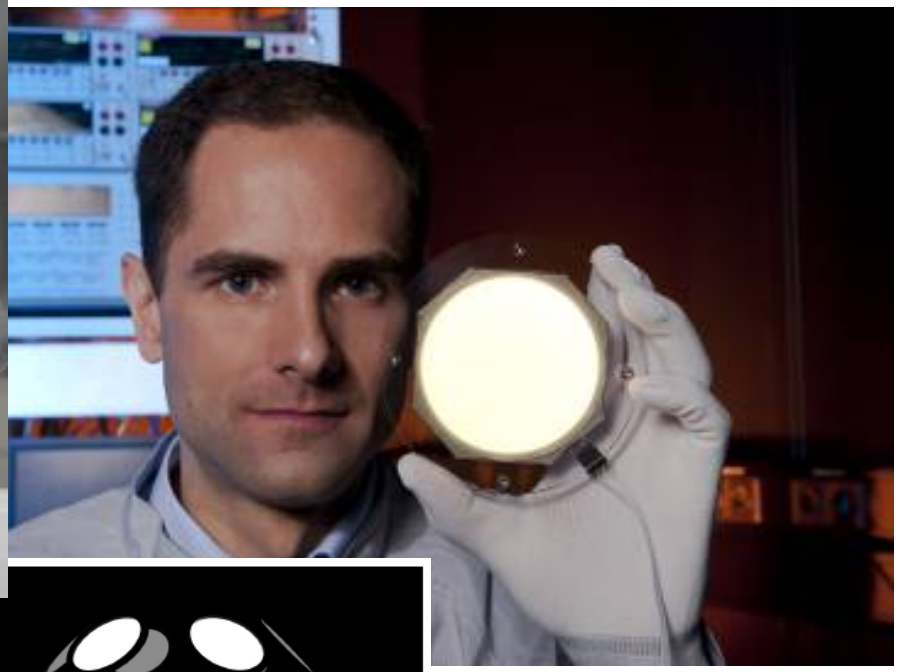
Expo: China Pavilion, World Expo Center - 'Green landmark' illuminated by OSRAM LED

- OSRAM lights the China pavilion with LED which emit their light over a distance of 66 metres.
- LEDs have a lifetime of 50,000 hours and save more than 70% of the energy consumed by conventional halogen halide floodlights.
- The lighting of the World Expo Centre is based on OSRAM's intelligent digital lighting management system
- OSRAM provides LED, fluorescent lamps and CFLi
- Energy savings of up to 33% compared with conventional lighting solutions will be achieved.
- Orbeos OLED panels form the frame of a mirror in the "We are the world" pavilion.
- In future ceilings or partition walls of light will be feasible.

The light of the future is here:
the first OLED panel light opens up new possibilities



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OLED – Bringing together energy saving, light quality and design

Customer benefits

- Harmony of design and light creates new markets to complement LED
- Surface-emitting panels allow non-glare, soft lighting
- The warm-white light color is similar to that of a conventional bulb, but consumes only half the power

OSRAM know-how

- Graduated product portfolio with varying times-to-market and depth of value creation

Summary:

- OSRAM is a preferred supplier thanks to its integrated LED portfolio of products, systems and solutions
- As innovation leader OSRAM drives the transition to Solid State Lighting and LED
- OSRAM remains best in class in Green technologies
- OSRAM contributes to solving global sustainability challenges and to environmental protection around the world

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London, Lighting & Design

- OSRAM is leading the technological development, but more can be done
- London designers win and influence lighting projects around the world
- LED will open up NEW design possibilities and have an even greater social impact

*Source: Lighting Industry Federation