Pioneering Energy Saving Road Lighting Solutions

Change in standards encourages early adoption of LEDs to replace HID lamps in UK

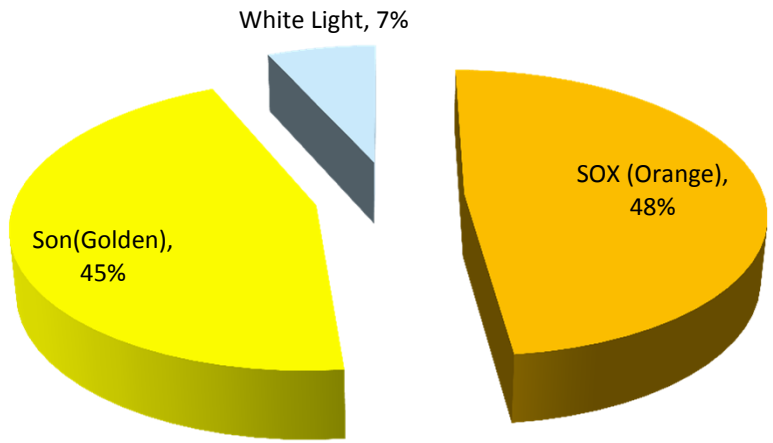
Nigel Parry

ROADLIGHTING | 2014 | Auckland, New Zealand

ORANGE TEK

UK Road Lighting Stock circa 2005

Lamp Type	%	Numbers
SOX (Orange)	48%	3,648,597
Son (Golden)	45%	3,406,817
White Light	7%	513,272



UK Street Lighting Energy circa 2005

Recent ILP survey suggested that the 70watt SON was the 'average' lamp.

SOX	48%	3,648,597
SON	45%	3,406,817
White	7%	513,272
TOTALS		**7,568,686**

Therefore in the UK roads:
7,568,686 street lights x 70wSon (85 cct watts) = 643,338,310 w

Burning 4100 hours per annum
= 2,637,687,071,000watts
or about **2.6 Terawatts**

Energy Reduction

Initial Reaction was to Switch Off but at what cost:

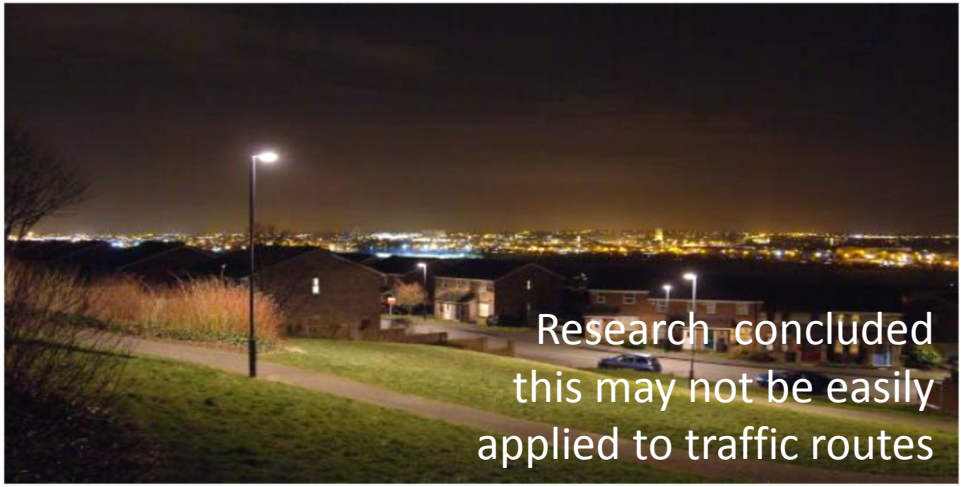
- In 2008 a resident of Llangynop, a village in South Wales, paid £295 to have his village lit at night for the winter after Powys Council turned off the street lights to save money.
- In 2011 Northamptonshire decide to save £2M by turning off 50% of all their Street Lights. Protest on the Streets.

- AA Reports -Six month figures, including the winter period, showed a 6% rise to 940 deaths on British roads.
- A report by children's charity PLAN UK highlighted that **91% of 13-18 yr old girls** said better street lighting would make a big difference to whether they felt safe on the streets

Changing Standards
Mesopic Vision – White Light

In 2003 the UK were the first country in the world to change national codes to allow a drop in lighting levels of one lighting class if white lights >Ra60 were used in the residential roads

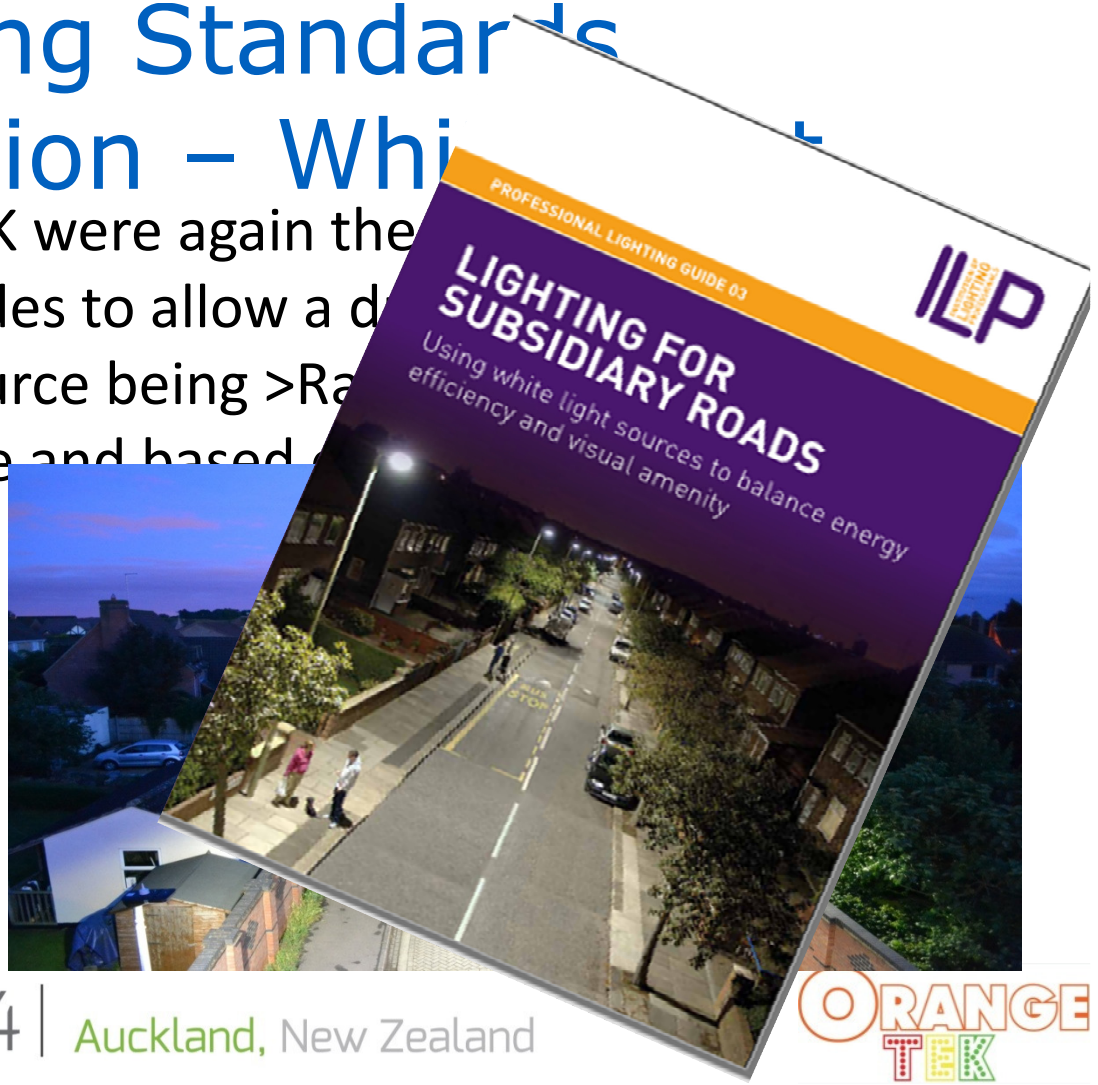
New lamp technology at the time, such as CPO made this affordable and provided some energy savings



Changing Standards
Mesopic Vision – Whi

In 2013 (BS5489:2013) the UK were again the
world to change national codes to allow a d
linked directly to the light source being >Ra
linked directly to ILP guidance and based
in the residential roads

Now LED technology is making this affordable and providing **significant** energy savings



Further research has yet to concluded this may be applied to traffic routes

EU Initiative

FOREWORD

by Neelie Kroes

Commission Vice-President for the Digital Agenda for Europe

The European Union has set itself the ambitious target of increasing energy efficiency by 20% by the year 2020. Lighting accounts for about 50% of the electricity consumption in cities. European cities can therefore play a major role in the reduction of the carbon footprint by large-scale deployment of highly innovative and eco-friendly LED lighting solutions.

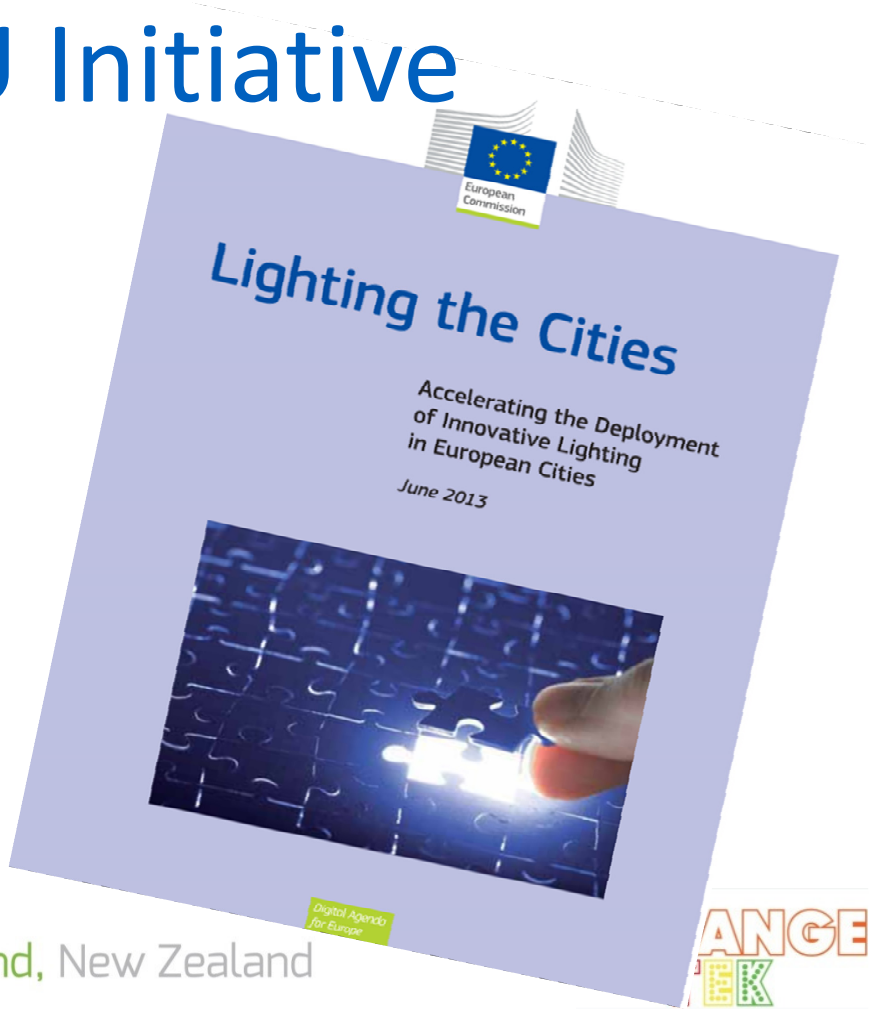
Today, LED lighting technology has come of age and is able to deliver benefits to cities and citizens alike. It offers more controllable and higher quality light, enhanced visual performance and improves the ambience and safety of urban environments. Moreover, LED lighting will make our cities 'greener' by saving up to 70% of lighting energy and reducing costs compared to existing lighting infrastructures. Procuring and deploying innovative lighting infrastructures at the municipal level also offers the potential to boost local innovation, growth and jobs.

The larger roll-out of intelligent LED lighting systems in cities will be part of the creation of sustainable smart cities: cities where lighting innovation is interlinked to other smart city networks (communications, renewable energy, building or traffic management systems). This is the ideal way to offer dynamically adaptable optimised lighting services to citizens and businesses.

This report provides guidelines on how best to proceed with the deployment of LED lighting in European cities. It addresses, in particular, cities that are still considering their first LED lighting projects or have limited experience in this field. The guidelines were compiled by a dedicated EU Task Force on Lighting European Cities, with the close involvement of several European cities, energy distribution companies, the lighting industry and financial institutions with experience in LED lighting projects.

This report is part of my Digital Agenda for Europe flagship initiative. It follows up on the Commission Green Paper 'Lighting the Future', which identified European cities as potential lead markets for speeding up the wider deployment of innovative LED lighting solutions.

I welcome this report, and I hope it will turn out to be an incentive for European cities to share Europe-wide their experiences, results and lessons learnt with the deployment of LED lighting.



UK Government Support

Green Investment Bank

Low energy streetlighting: making the switch

A market report by the UK Green Investment
February 2014

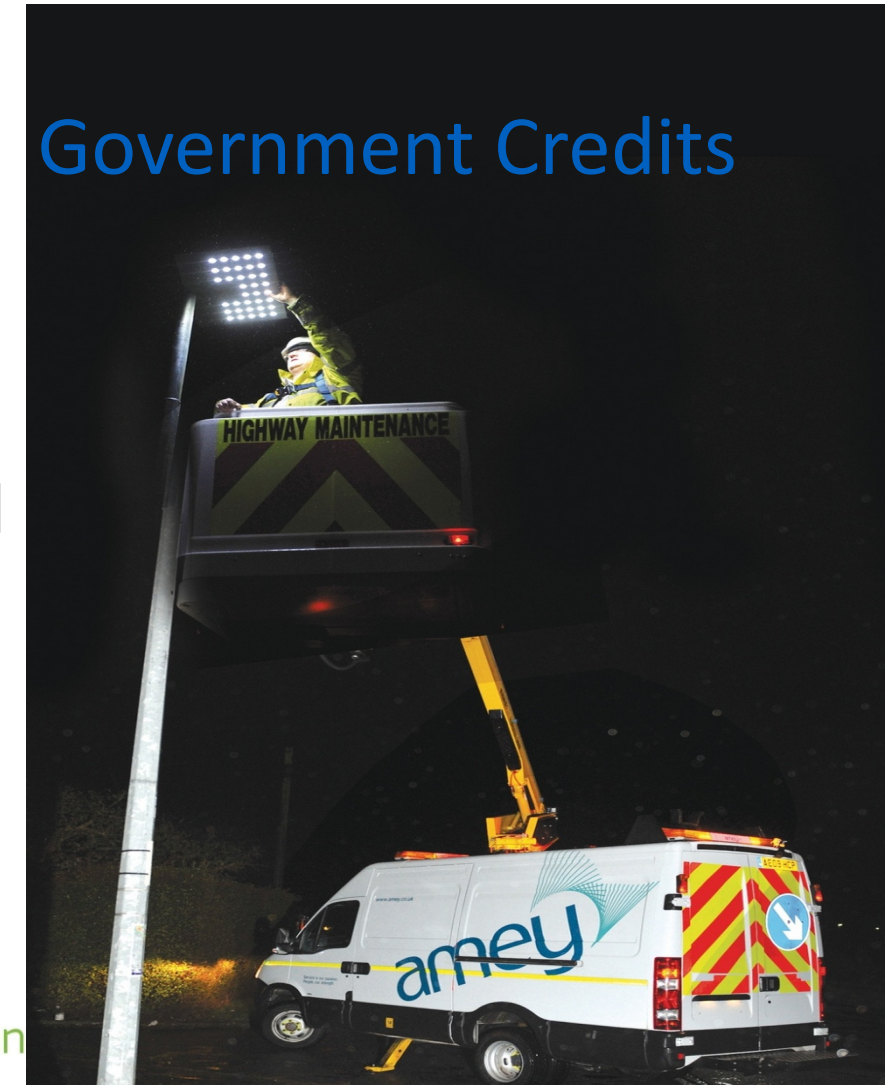
ROADLIGHTING | 2014 | Auckland, New Zealand

ORANGE TEK

Trend Setters PFI – Government Credits

Birmingham

- The first major role out of LED luminaires in residential areas. More than 41,000 WRTL/Philips Stelas are being installed across Birmingham.



Post PFI
Local Authorities take the plunge

LA's source funding to capitalise energy saving initiatives

- Peterborough
- Leicester
- Swansea
- Rotherham
- Dumfries and Galloway
- North Lincolnshire
- East Sussex
- Plymouth
- Hull
- Durham
- Glasgow
- Northumbria
- LB Ealing
- Salford
- Buckinghamshire
- LB Bromley
- Bournemouth
- Manchester

UK Locations

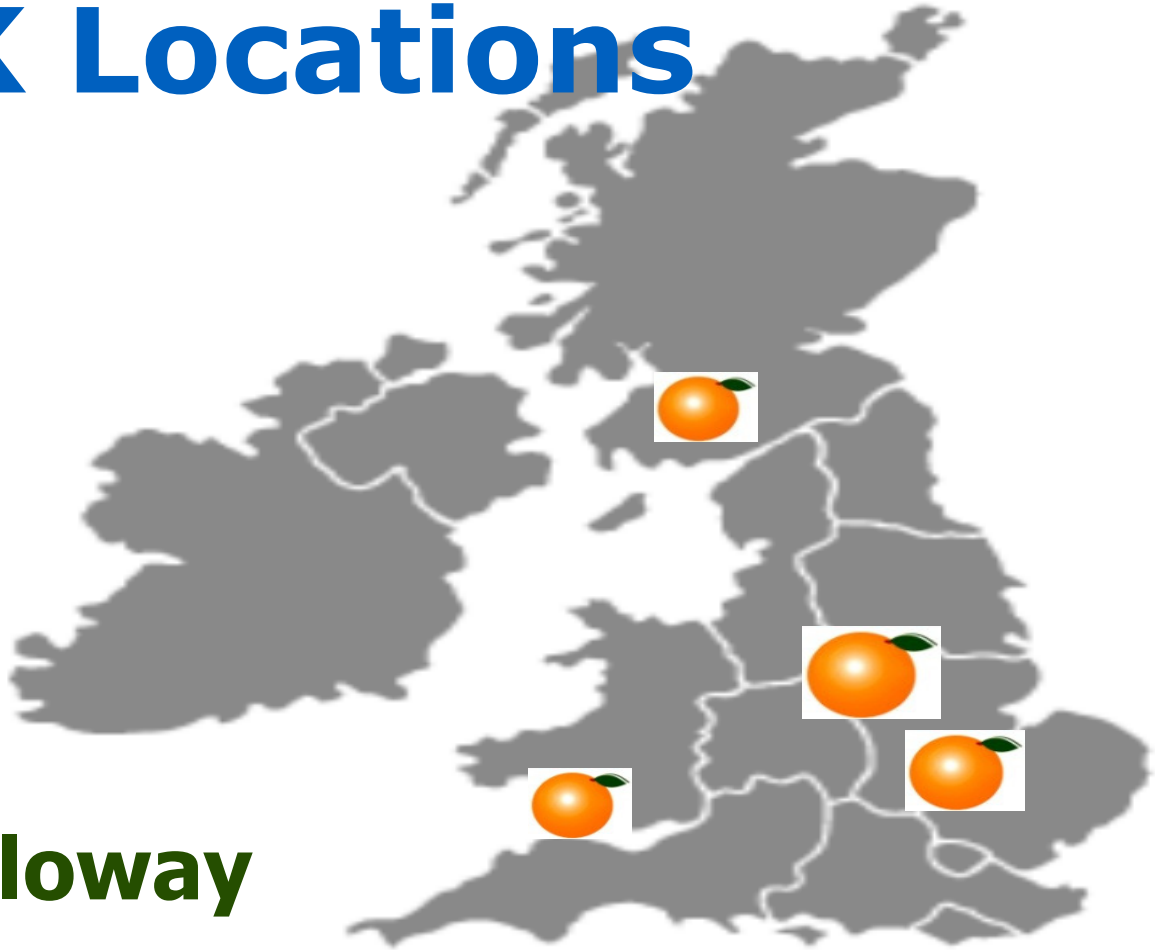
Review :

Peterborough

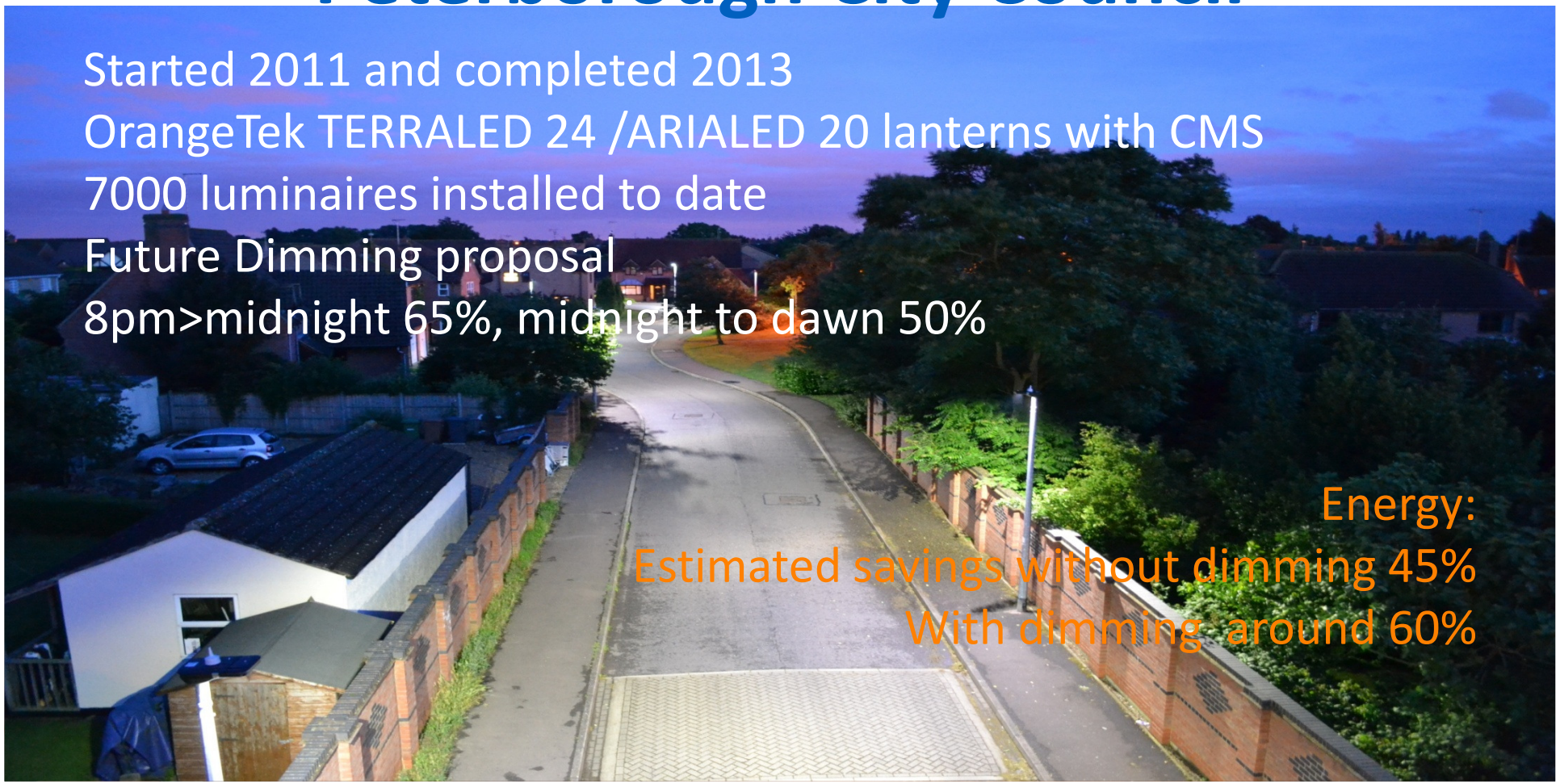
Leicester

Swansea

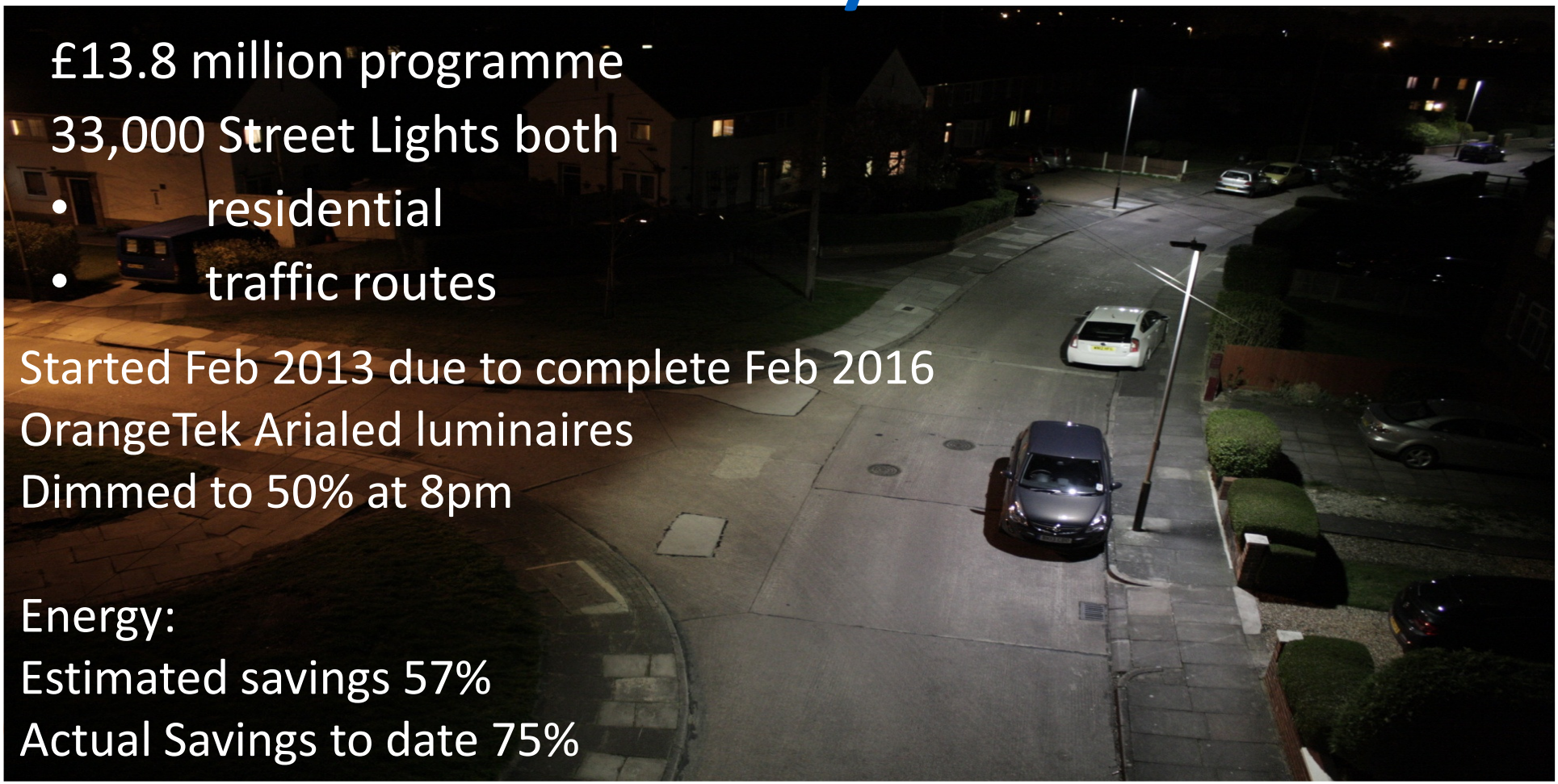
Dumfries & Galloway



Peterborough City Council



Leicester City Council



£13.8 million programme

33,000 Street Lights both

- residential
- traffic routes

Started Feb 2013 due to complete Feb 2016

OrangeTek Arialed luminaires

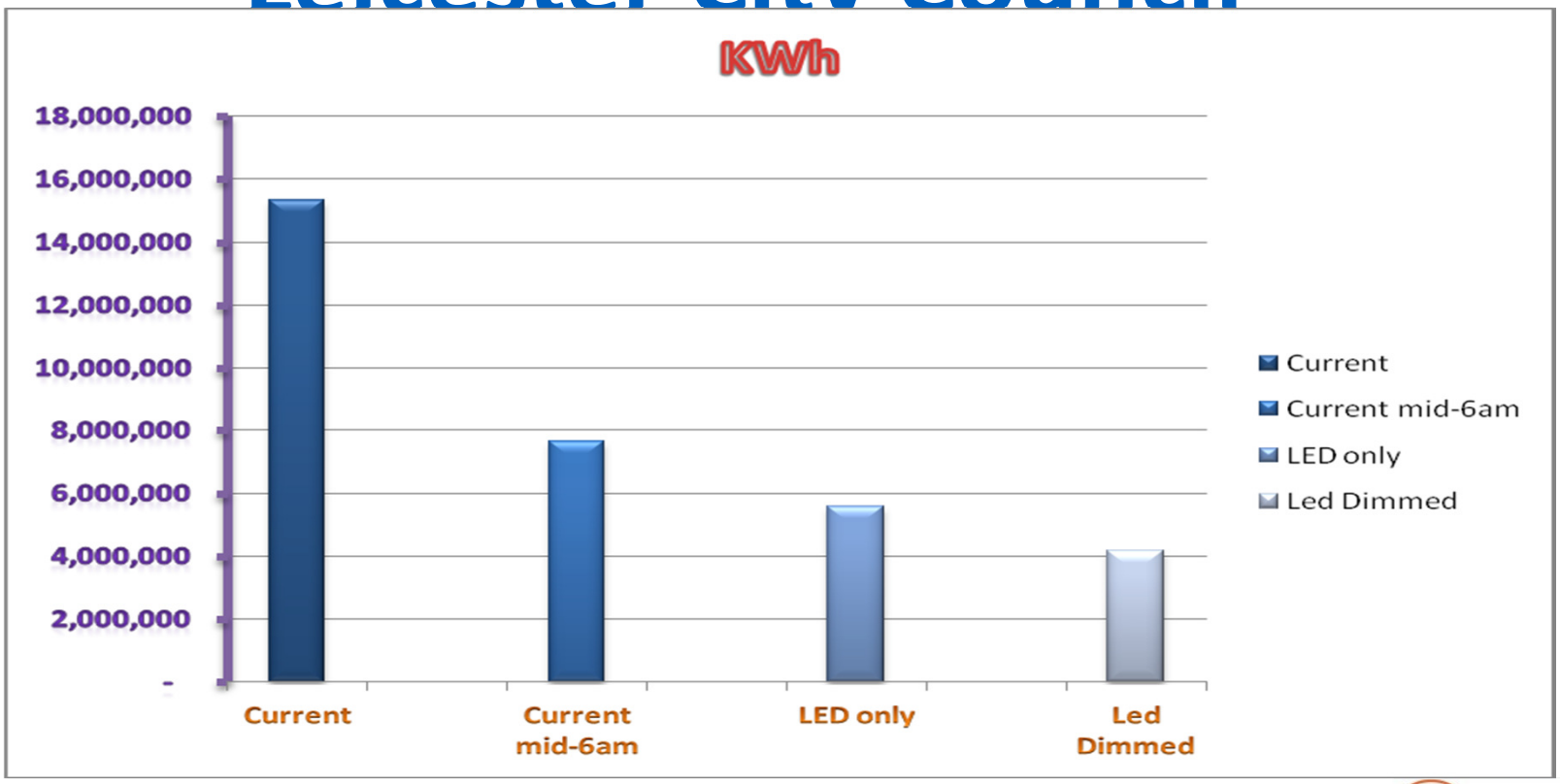
Dimmed to 50% at 8pm

Energy:

Estimated savings 57%

Actual Savings to date 75%

Leicester City Council

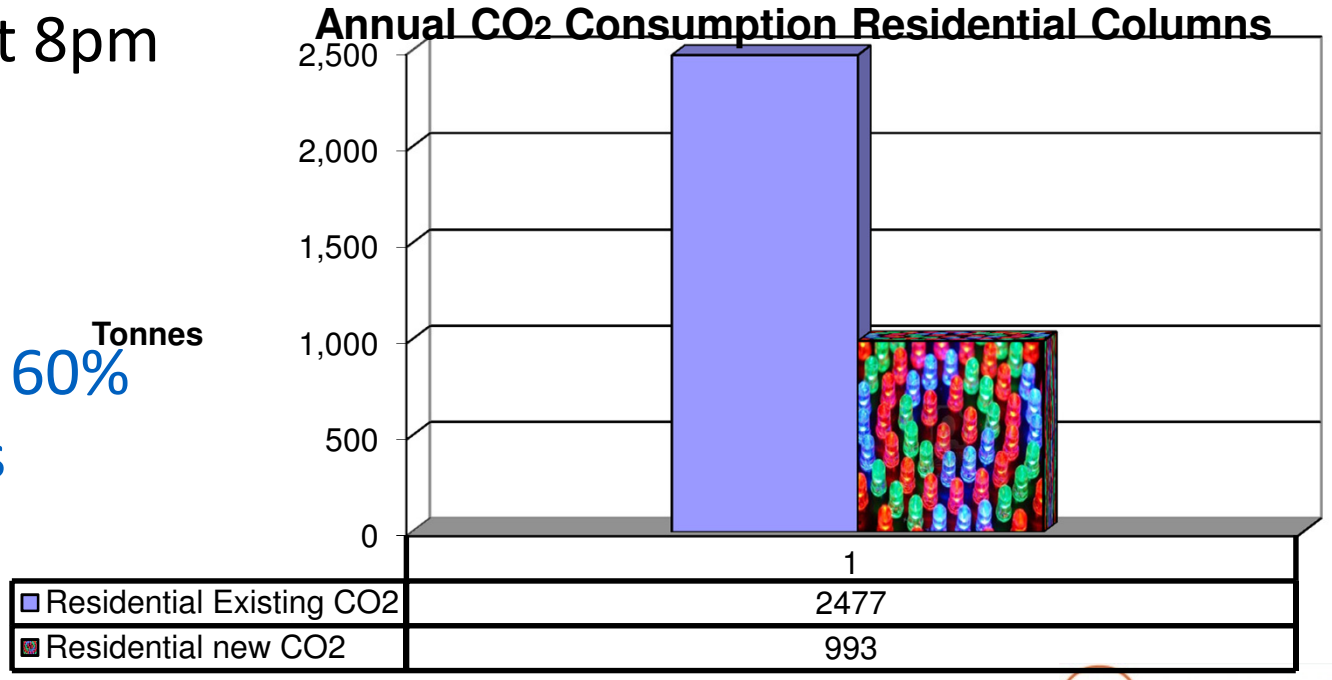


Swansea City Council

Started 2012 – on-going

OrangeTek ARIALED 30 and 40

Dimmed to 70% at 8pm

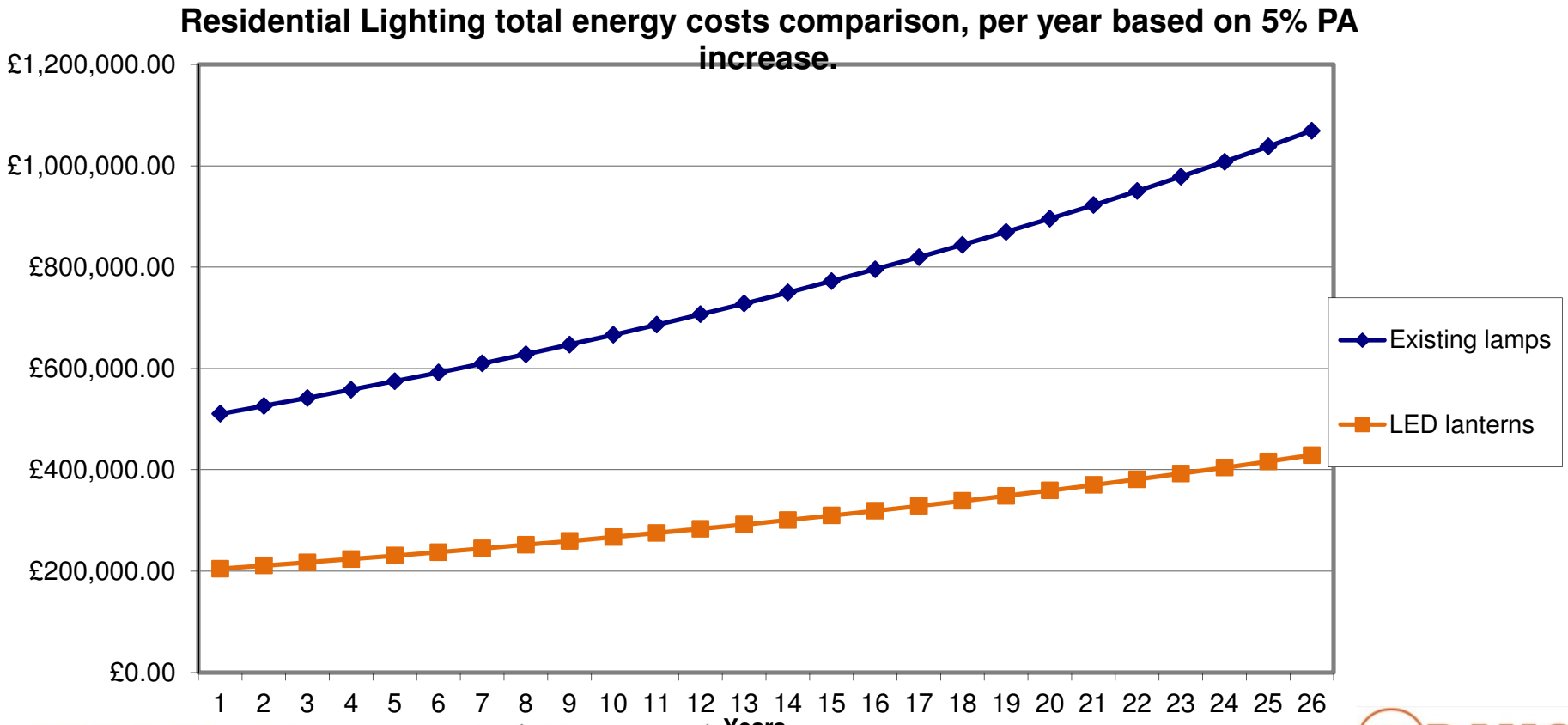


Energy:

Estimated savings 60%

Payback in 4 years

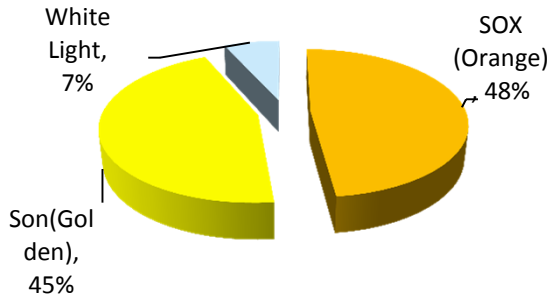
Swansea City Council



Dumfries & Galloway

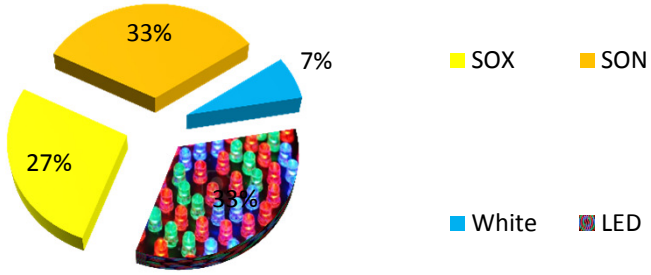
UK Road Lighting Stock circa **2005**

Lamp Type	%	Numbers
SOX (Orange)	48%	3,648,597
Son (Golden)	45%	3,406,817
White Light	7%	513,272



UK Road Lighting Stock circa **2015**

Lamp Type	%	Numbers
SOX	27%	2,043,519
SON	33%	2,489,000
White	7%	513,272
LED	33%	2,522,895



ORANGE TEK

It’s an energy revolution

LEDs are not only here but LEDs are here in numbers

LEDs could account for around 33% of UK stock in 24 months

Therefore on the UK roads in 2015:
5,045791 street lights x 70wSon(say 85cct w)= 428,892,235 watts
2,522,895 street lights x 30w LED(say 31cct w)=78,209,745 watts

Burning 4100 hours per annum = 2,079,118,118,000watts
or about **2.0 Terawatts = Saving 0.6 Terawatts compared to 2005**
OR ABOUT 20% OF UK STREET LIGHTING ENERGY BILL

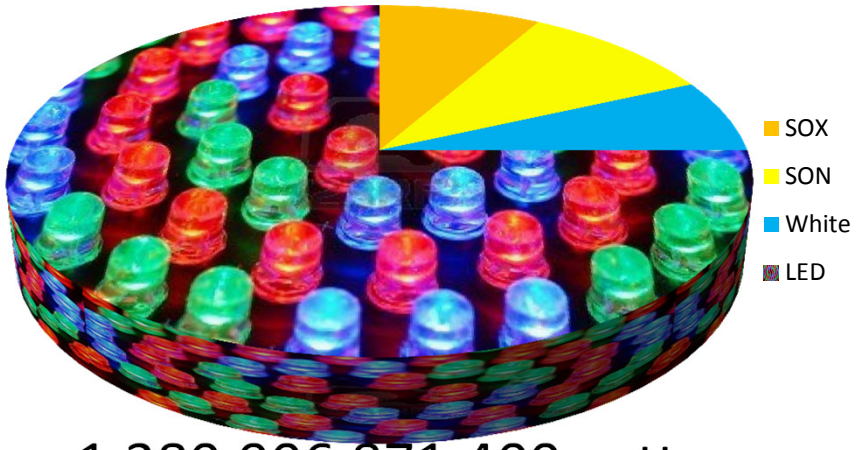
ROADLIGHTING | 2014 | Auckland, New Zealand

ORANGE TEK

It’s an energy revolution

LEDs are predicted to account for around **75%** of the street lighting market by **2020**

Lamp Type	%	Numbers
SOX	8%	628,900
SON	10%	750,000
White	7%	513,272
LED	75%	5,676,514



Still burning 4100 hours per annum = 1,380,906,871,400watts

or say **1.3 Terawatts = Saving 1.3 Terawatts compared to 2005**

OR ABOUT 50% OF UK STREET LIGHTING ENERGY BILL

Changing World

- New Research
  - CIE
- New Standards
  - CEN & BS
- New Technology
  - LEDS & CMS

So if the Futures Bright…

- Lantern Manufacturers
  - UK market saturated in 2020
- Local Authorities
  - Still required but maybe not so many staff
- Design Consultants
  - As Clients – still required but maybe not so many..
- Contractors
  - Workload will drop to 25% and thus some contraction in contractors is likely

Thanks for getting up early and for your attention

Questions?

nigel.parry@orangetek.co.uk
+44(0)7968 823 066