ILP INSTITUTION OF LIGHTING PROFESSIONALS

NATIONAL STREET LIGHTING SURVEY

REPORT - June 2019

'Findings suggest that the UK is currently halfway to a full LED street lighting conversion'

Sponsored by Carbon Reduction Technology Ltd

Foreword

Lighting engineers and specialists are the cornerstone of why we, the ILP, exist.

In order to maximise the support we can provide and keep education and best practice offerings on the cutting edge of relevancy, it is essential to cultivate an informed and robust understanding of how technologies and initiatives are being put into practice.

By shining a light on how key technologies and schemes are being utilised, and their success, we can give local government lighting departments inspiration, reassurance and quantitative evidence to support and reinforce their own future projects. Thanks go to Ian Jones, our VP Local Authorities, for leading the ILP's involvement in this crucial project.

Tracey White, CEO
Institution of Lighting Professionals

Like all polls, the ILP's National Lighting Survey, in association with Carbon Reduction Technology, is a snapshot in time.

But its findings nevertheless serve to illustrate some wider, and important, longer term trends around the recruitment and retention of lighting professionals within local authorities; the casualisation, outsourcing or contracting-out of roles and responsibilities; the appetite for part-night and dimming lighting regimes; and the arguments for retrofitting versus replacing.

To that end, it is I feel an insightful piece of research that ILP members would do well to think about and reflect upon. It contributes to a valuable conversation that needs to be had.

Nic Paton, Editor
The Lighting Journal

This study represents an exciting starting point for fully understanding and recognising the work undertaken by local authority lighting departments and the achievements they are making in emissions and energy reduction.

Just as importantly, the data in the report can be used as a benchmark for future studies, enabling lighting engineers, education and support services, suppliers and manufacturers alike to gain a fuller understand of employment opportunities, new and ongoing energy saving trends and the emergence of new technologies and lighting infrastructure.

This understanding is essential to the evolution of the industry.

Alan Robson, Director
Carbon Reduction Technology

Introduction

Public street lighting represents a significant consumption in energy and emissions for the UK every year, making the work being coordinated by local authorities to upgrade their public lighting infrastructure and install more efficient and versatile technology crucial.

Study findings suggest that a full nationwide conversion to LED street lighting could actuate annual savings of 1.7 million megawatts and over half a million tonnes of CO2.

As of March 2019, conversion to LED has progressed to 51%, with an estimated 40% of all remaining lights within the study remit already assigned to a supplier for upgrade. Progress is accelerating rapidly and forecasts indicate that by December 2020, the country will have advanced to a 66% conversion.

Study Parameters

The 2019 National Street Lighting Survey was designed to capture a snapshot of local authority lighting, which would benefit local government lighting departments, suppliers, manufacturers and lighting education, support and service providers alike. Through this study, we hope to provide insight into the current status of UK local authority lighting, key emissions and energy reduction achievements, the role of locally employed lighting specialists and popular initiatives, such as retrofitting and dimming / part-night regimes.

The survey was offered to all metropolitan district, county, unitary and London borough councils in the UK. The response rate was approximately 38%, with good representation from each area of the UK. The study covered locally governed conventional and heritage model street lights operating at heights of up to 12m and focused on conversion to LED. The study does not cover motorways and trunk roads.

We asked participants to provide data accurate to March 2019 and a forecast for December 2020.

CARBON REDUCTION TECHNOLOGY

The 2019 National Street Lighting Survey and Report were sponsored and supported by Carbon Reduction Technology Ltd., and administrated by The Yorkshire Marketing Machine.

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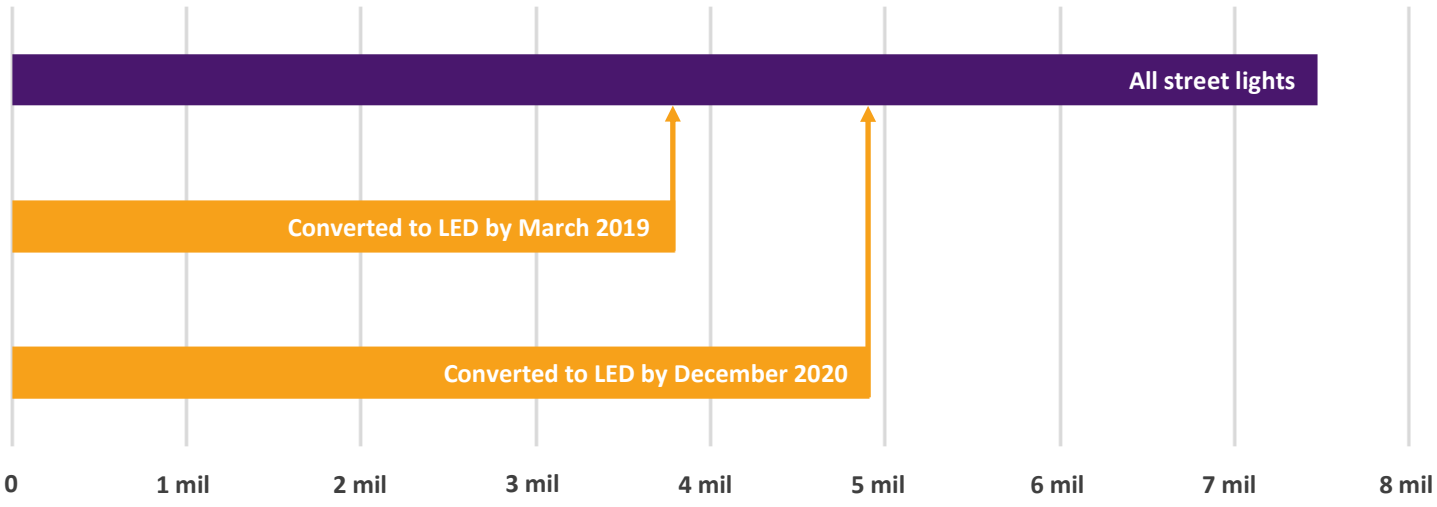
Conversion to LED

Some of the most important data we collected with the survey allowed us to calculate national progress in the conversion to LED technology, plus actual and potential savings in both energy and carbon emissions.

We asked participants to provide data accurate to March 2019, plus a forecast for December 2020.

Approximately **10%** of local authorities have now fully converted to LED and, of the remainder, **20%** have fewer than 2,000 luminaires to convert



	March 2019	December 2020
% of street lights converted to LED	51%	66%
# of street lights converted to LED (estimated)	3.8 million	4.9 million

Study findings suggest that **40%** of all remaining unconverted street lights have already been assigned to a supplier for conversion

Energy & Carbon Savings

	Conventional luminaires mounted on:				
	6m posts & below	8m posts	10m posts	12m posts	Heritage Lanterns
Avg. original wattage	66w	120w	179w	260w	98w
Avg. new wattage	27w	57w	91w	117w	42w
Avg. power reduction per luminaire	39w	63w	88w	143w	56w

	March 2019	December 2020
Annual LED conversion energy savings	860,000 megawatts	1,146,000 megawatts
Annual LED conversion CO2 emissions savings	257,000 tonnes	342,000 tonnes

Salix

Study findings suggest that **13%** of all local authority projects to upgrade street lights to LED have been supported by Salix funding

Estimated potential following nationwide conversion to LED

Study data suggest that the energy saving potential following full LED conversion is in the region of:

1,723,502

megawatts of electricity per year

Study data suggest that the potential savings in carbon emissions following a full LED conversion is approximately:

514,982

tonnes of CO2 per year

Dimming & Part-Night

In addition to upgrading to more efficient technology, dimming and part-night regimes are a further popular and effective strategy for reducing the energy consumption and carbon emissions of public sector street lighting.

We asked survey participants if they were running any such schemes and, if so, how many kWh they saved annually in each category.

Dimming Regimes

- 52% of local authorities are running dimming regimes, including both large scale and trial sized projects
- Only 8% of local authorities running dimming programs save *less* than 10,000 kWh per year
- The average saving of a dimming regime is 2.1 million kWh per year, per participating authority
- A minority of authorities with wide-scale implementation of dimming regimes report savings in excess of 12 million kWh

Study findings suggest that current national annual savings for dimming regimes is **179,000 megawatts**, equating to **53,500 tonnes** of CO2 per year

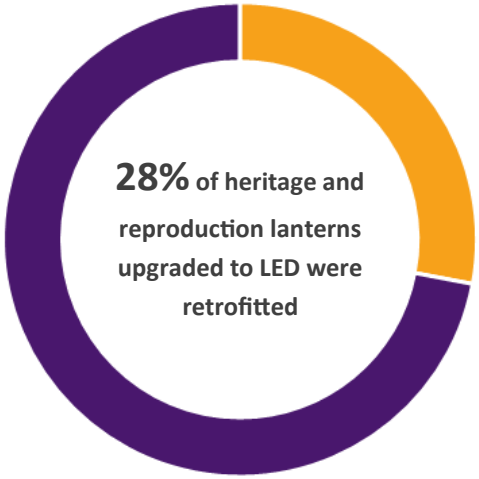
Part-Night Regimes

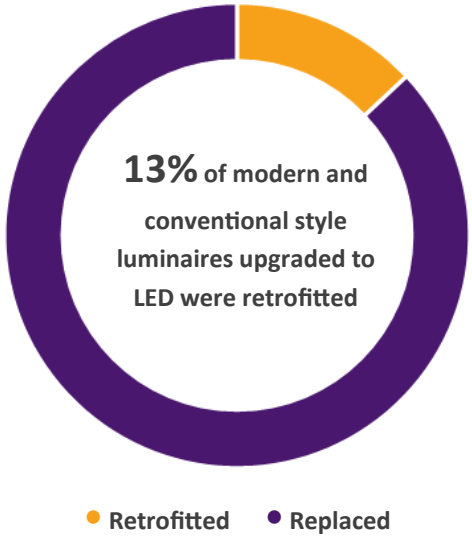
- Only 19% of local authorities report running part-night regimes of any scale, including small trials
- The largest part-night scheme reported via the survey saves 938,000 kWh per year
- The average saving from a part-night regime is 258,000 kWh per year, per participating authority
- Only 14% of local authorities report running *both* dimming and part-night regimes concurrently (on any scale)

Study findings suggest that current national annual savings for part-night regimes is **12,400 megawatts**, equating to **3,700 tonnes** of CO2 per year

Retrofit Vs Replace

Another key question addressed by the survey was retrofit versus replace. It is well-recognised that one of the key planning decisions for any local authority in the current financial climate is the option of whether to retrofit rather than replace. Whilst retrofitting is not always a viable option, when it is possible it can offer project cost savings and a significant reduction in supply chain carbon footprint and waste disposal. We therefore asked participants what percentage of their upgraded street lights and heritage lanterns had been retrofitted versus replaced.





17% of UK local authorities have retrofitted more than **90%** of their lanterns

Just **4%** of authorities report retrofitting over **90%** of conventional street lights.

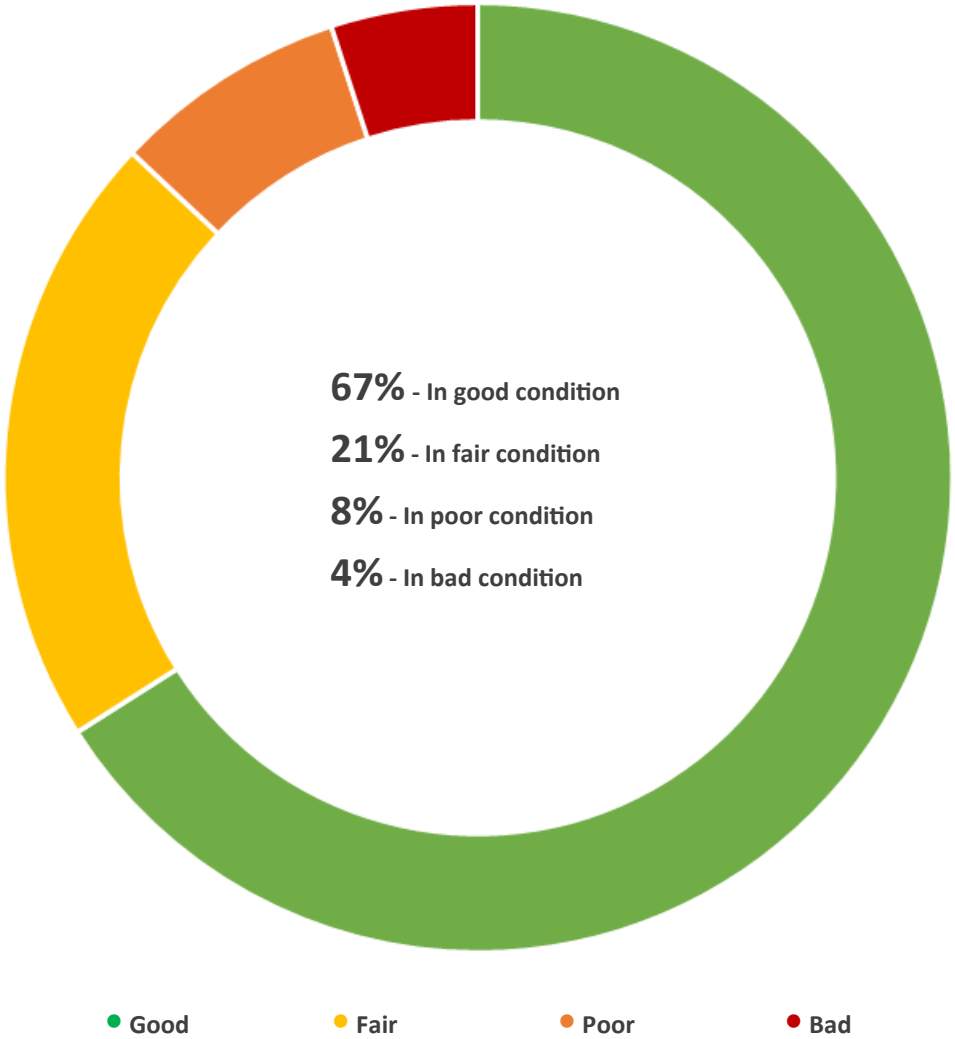
	North of England	South of England	Scotland	Wales	Northern Ireland
% of conventional street lights upgraded to LED via retrofit	11%	25%	9%	14%	70%
% of heritage lanterns upgraded to LED via retrofit	30%	28%	18%	53%	N/A

Based on the study results, conventional street lighting luminaires outnumber heritage and reproduction lanterns by 48:1

Street Light Condition

Whilst great strides have been made in inventory management, having a good understanding of the physical condition of that inventory is a key component of asset management. We asked participants to divide their inventory into four condition categories: good, fair, poor and bad.

The condition rating covers all lights with the study group, including lights which have already been upgraded to LED.



In good condition: Approximately 5,000,000 street lights

In fair condition: Approximately 1,600,000 street lights

In poor condition: Approximately 600,000 street lights

In bad condition: Approximately 300,000 street lights

Potential to retrofit

Speculatively, findings suggest that of the remaining unconverted street lights in the UK, up to 2.5 million may be in a suitable condition for retrofitting

Lighting Specialists

We evaluated the population of lighting specialists employed within local government to set a benchmark figure which can be used in future research to determine if employment opportunity is growing or shrinking. We also examined access to ILP resources and the scope of responsibility, in terms of luminaire volume. We also chose to focus on 'lighting specialists' rather than 'lighting engineers', as lighting teams can be inclusive of a much more diverse range of qualifications and skillsets.

The study indicates that there are just above **600** lighting specialists directly employed by local authorities within the UK public sector

Approximately **13%** of local authorities reported having no lighting specialists on staff and only **22%** employed more than 3 lighting specialists

We found that on average, **52%** of all locally employed lighting specialists held memberships with the Institution of Lighting Professionals

9% of UK local authorities report active ILP memberships for employees *not* classed as lighting specialists, including **40%** of the authorities with no lighting specialist on staff

	North of England	South of England	Scotland	Wales	Northern Ireland
Avg. number of lighting specialists employed by local authorities*	4	2.5	3	2.5	14
Avg. number of street lights per employed lighting specialist	12,162	12,326	8,965	7,551	5,201
Lighting specialists ILP membership	51%	57%	45%	53%	20%

*Rounded to the nearest whole or half number

Where next?

Whilst the surveyed data gives a great deal of essential insight into the current status of local authority lighting, this study also sets benchmark figures which can be utilised in further, future studies and raises important secondary questions:

Lighting Specialists

It is widely believed that employment opportunity for local government lighting engineers and specialists is shrinking, as more authorities partially or fully outsource their lighting needs to third party service providers. A secondary headcount, at a future point, could provide factual evidence of any growth or decline, plus indicate the rate at which any change is occurring.

Emerging Technologies

LED is now a well accepted and standard technology within the public sector. Whilst conversion continues, new technologies and innovations are beginning to gain a foothold, which are likely to cause a knock-on effect to lighting infrastructure.

For example, new infrastructure and procedures supporting Smart Cities, EV integration and asset condition monitoring are all likely to impact public lighting strategies and affect / add to the responsibilities currently managed by local authority lighting departments. Future research is required to track and support this evolution.

Conversion Progress

The data gathered from our survey respondents has allowed us to gauge the nation's progress in the conversion to LED and has allowed us to forecast this progression up to December 2020, which is a key assessment milestone for the Paris Agreement initiative. We have also established that close to half of all remaining unconverted street lights have been assigned to a supplier for conversion and the data strongly suggests that the rate of conversion is accelerating rapidly.

What we have been unable to do is to accurately predict what additional energy saving initiatives such as dimming and part-night regimes may look like in the years to come. Therefore, it will be important to resurvey and revalidate our conversion findings, and establish a rate of growth and expansion for secondary energy management schemes.

Disclaimer

The data presented within this report is based on the responses received to the survey and is accurate and correct to the best our knowledge.

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