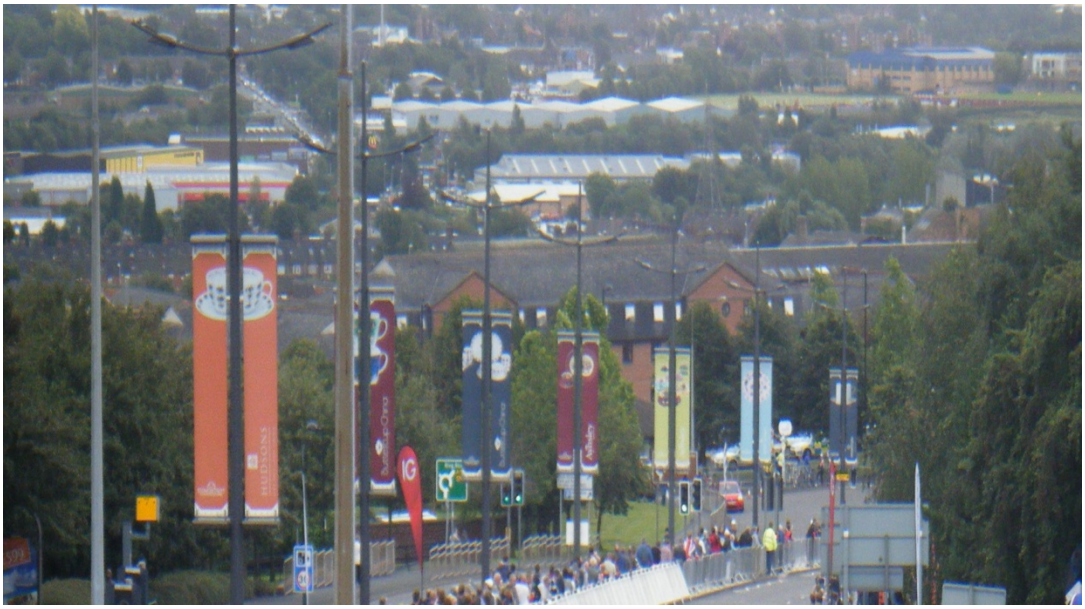
sse Enterprise | Lighting

working in partnership with city of stoke on trent

Public Street Lighting

PFI Annual Service Report 2014



Contents

1 – Introduction

This Annual Service Report relates to the City of Stoke on Trent Council Public Street Lighting and has been prepared by the PFI Service Provider in partnership with the Authority to provide an overall summary of performance when considered against the performance indicators.

The performance indicators are as listed in the output specification of the Project Agreement. The report will also consider other requirements of the output specification that are listed as forming part of the Annual Service Report. Specifically the report has been prepared in accordance with the requirements of the output specification and will provide details of the following:

1. Graphical representation of Lighting Performance Indicators (LPI's) showing trend analysis over the previous twelve months.
2. Environmental considerations.
3. Details of local crime and community safety statistics.
4. Details of local road safety statistics.
5. Innovation
6. Progress of Asset Replacement Program.
7. Health and safety data.
8. Customer Feedback in graphical formats.
9. Continuous improvement update.

2 – Best Value Performance And Local Performance indicators

This section of the Annual Service Report focuses on the Service Providers performance against the relevant and local performance indicators for the Project.

a) LP1 Percentage of lighting points working as planned.

b) LP2 Percentage of apparatus more than twenty five years old.

c) LP3 Percentage of streets which conform to the lighting standards referred to in the output specification.

d) LP4 Average time to repair a non-emergency fault from first being reported.

e) LP5 Average time to attend an emergency repair.

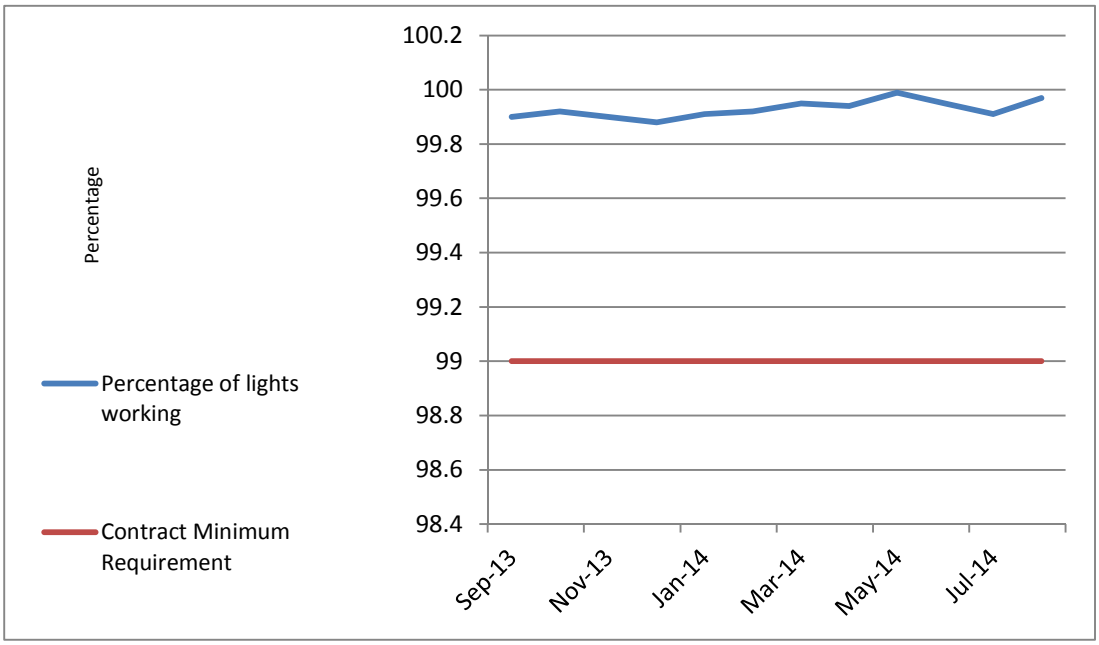
f) LP6 Percentage of inefficient light sources.

g) LP7 Number of repeat visits associated with non-emergency faults.

h) LP8 Number of requests for additional lighting.

The requirement for the Annual Service Report is to provide graphical representation of the above performance indicators. The information contained in the Monthly Monitoring Reports each month has been collated and is detailed on the graphs below. This information details the trends of the performance of the Service Provider for the past twelve months of the Project.

a) LP1 Percentage of Lighting Points working as planned



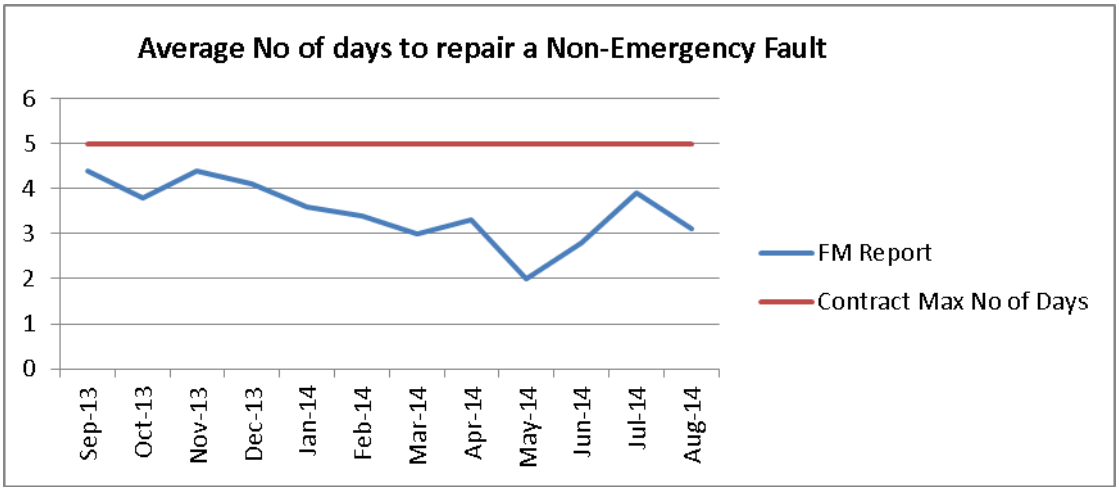
b) LP2 Percentage of apparatus more than 25 years old.

This equates, at the time of this report, to 0.37% of lighting columns that have not yet been replaced. These are in areas of the city that are awaiting or undergoing re-development.

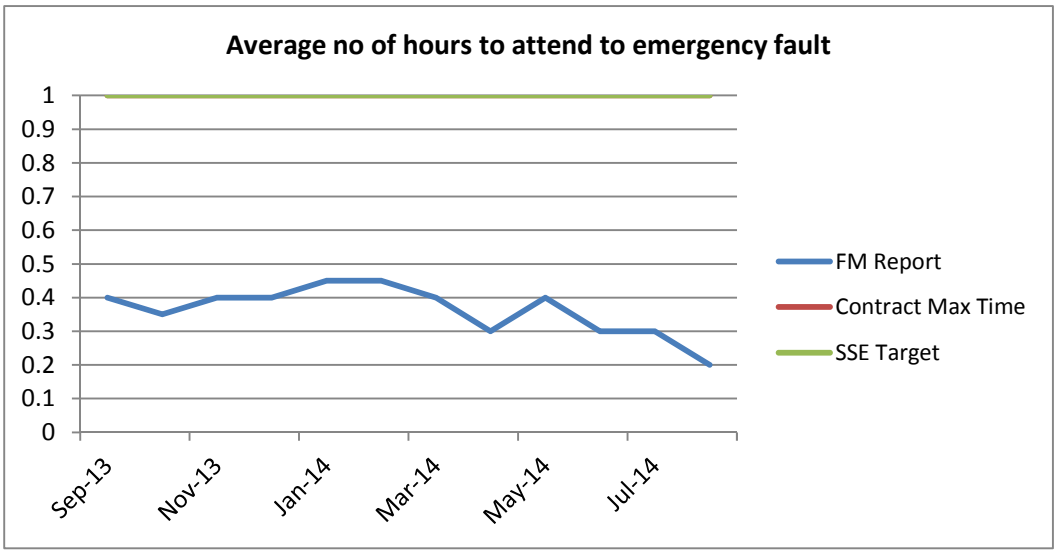
c) LP3 Percentage of streets which conform to lighting standards.

At the time of this report the percentage of streets which conform to the lighting standards as referred to in the output specification is 83%.

d) LP4 Average time to repair a non-emergency fault from first being reported.



e) LP5 Average time to attend to an emergency repair.

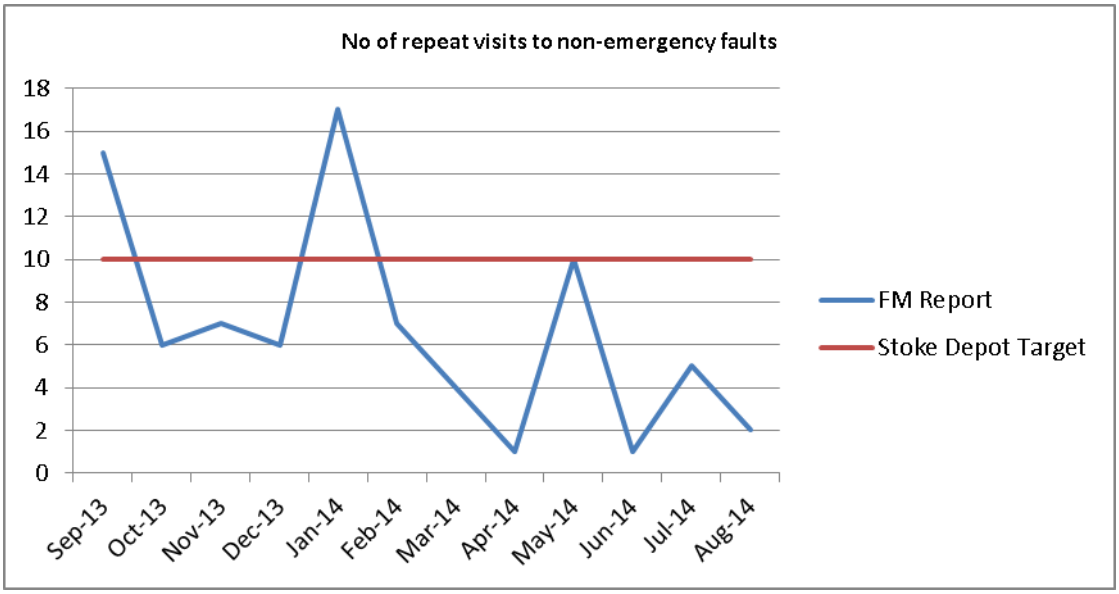


Contract Max Time is 1 hour and is hidden under SSE target time.

f) LP6 Percentage of inefficient light sources.

At the time of this report the percentage of inefficient street lights is 17%. This will decrease as the contract progresses.

g) LP7 Number of repeat visits associated with non-emergency faults.



Note: 'Stoke depot target' is a self-imposed target that Stoke SSE aim to not exceed each month.

SSE are always striving to reduce the number of repeat visits. The implementation of electronic fault logging equipment as opposed to paperwork is now being used to attend to faults. This avoids unnecessary visits and duplicate attendances.

h) LP8 Number of requests for additional lighting.

Since the commencement of the PFI project there have been 453 no requests for additional lighting in the form of Clause 6 and Clause 9.5 requests.

For example, in 2014 SSE received an additional lighting request from the Local Authority in the form of Station Gateway Canal footpath link. A new footpath had been created alongside part of Cauldon Canal providing a link to College Road, allowing access for students using Stoke on Trent College and the general public using Hanley Park. We subsequently installed 3 lighting columns along the footpath to complete the project.

3 – Environmental Considerations

SSE has been awarded an ‘A’ rating for managing its impact on climate change.

The company has been included in the global Climate Performance Leadership Index, one of the most important annual assessments of how large global operations impact on the environment. CDP assessed over 2,000 companies with just 187 achieving an ‘A’ rating.

The report highlighted how SSE’s growth and output of renewable electricity has contributed to a 15% fall in its carbon emissions in 2013/2014.
SSE was also commended on the range of information it discloses on its climate change impact. The company has invested in improving the transparency and quality of information available to give a more detailed and comprehensive picture.

Justyn Smith, Head of Sustainability and Corporate Reporting at SSE said: “There is no getting away from the fact that as one of the UK’s largest generators of electricity we are responsible for the emission of a large amount of CO2. But we are also the UK’s largest generator of renewable electricity and have invested over £3.7bn in renewable generation assets over the last seven years.
What the ‘A’ performance rating shows is that SSE recognises the environmental impact it has and although there is still a lot to do, is taking meaningful action to improve its impact and decarbonise its generation impact.”

The annual energy consumption for street lighting in the City of Stoke on Trent for the previous year was 16,460,633 kwh. Since the energy purchased for the city is from renewable sources and is exempt from climate change levy, there is therefore the equivalent of zero carbon emissions.
The electricity supplier ensures that for every unit of electricity used, the same amount of green electricity is generated.

4 – Crime and Community Safety

The table below shows the trend for notifiable offences recorded by Staffordshire Police for the Stoke on Trent area. The table shows a comparison from 2012-2013 to 2013-2014.

Offence	2012-2013	2013-2014
Violence against the person	4965	5820
Robbery	191	245
Domestic burglary	870	857
Non domestic burglary	1235	1021
Vehicle offences	1657	1444
Theft from the person	174	202
Criminal damage & arson	3833	3829

Data has been provided by the Office for National Statistics.

The above table shows the fluctuation in figures since the beginning of the PFI contract. These figures are an indication of how the combination of street lighting improvements and local strategies launched by Stoke on Trent City Council affect crime within the City.

5 – Road Safety

The Government's casualty reduction targets were achieved in Stoke-on-Trent over the last ten years showing an improvement after the introduction of the PFI project. However the table below, showing an overview comparison between 2012 and 2013, indicates there has been an increase in casualties/injuries on the roads in the city.

Road Accident Data	2012	2013
Killed or seriously injured	36	45
Slightly injured	613	658
Child Killed or seriously injured	8	3
Motorcycle casualties	51	81
Pedal cycle casualties	34	62

The above data for Stoke-on-Trent has been provided by Staffordshire Safer Roads Partnership/Staffordshire Police.

6 – Innovation

SSE strives to introduce new ideas with the emphasis on customer service, safety and innovation.

Portable Fault Logging System

Portable Fault Logging System

In addition to our Night Patrol Scout all our SSE repair operatives are now issued with a portable fault logging system. This hand held device is directly linked to our FM reporting and enables repairs to be sent directly to the individuals already out on site reducing the need for paperwork.

This has proved to be an efficient and time saving tool, enabling operatives to attend to repairs more easily. With reference to Graph D, Performance Indicator No 5 in Chapter 2, the results are showing a noticeable downward trend in the amount of time taken to attend to repairs.

Mayflower Intelligent Management Systems

SSE invested in Mayflower in 2009 and now uses the system throughout its more recent PFI contracts.

Mayflower is a management system that enables street lights to be controlled from a central position. This enables:

- Individual lamp control capability
- Control of lamp output and dimming
- Timed dimming
- Variable burning hours
- Identification of electrical faults

A node is installed on each lighting unit. In simple terms, the node replaces a photo-electric cell and acts as a radio controlled switch that also transmits data such as voltage, current, wattage and power factor.

The use of Mayflower reduces energy use therefore providing savings on both energy and carbon. The technology allows better control of lighting and the light output can be varied without the need to switch off lighting at night. The light given out can be altered to suit the area being lit which reduces costs and also increases the life of the lamp.

As the system is remotely monitored it can provide an accurate measurement of electricity consumption and energy forecasts.

Skate Plaza – Central Forest Park

Mayflower has the potential to revolutionise street lighting in the UK and Stoke on Trent is no exception. The Mayflower system is partially used throughout the city, primarily in parks and recreation areas and is being installed in the new street lighting in the major public realm regeneration works in the city centre.

7 – Projects

SSE are working in partnership with Stoke on Trent City Council on the city's ongoing major regeneration project to transform the city centre.

SSE has installed new street lighting throughout the city, including in the vicinity of the city's brand new bus station. SSE has also installed bus re-routing signage and has undertaken two major sign de-cluttering projects.

We were also involved in providing new signage for the new St Peter's Academy in Fenton Manor and in conjunction with local authority we have installed parking restriction signage outside schools across the city, helping to make schools safer for our children.

SSE installs and removes of all types, both illuminated and non-illuminated.

From tourist information signs to parking signs, we work in conjunction with Stoke on Trent Council to ensure the city is easy to travel around.

8 – Asset Replacement

The Initial Asset Replacement Programme (IARP) is now complete
and SSE are continuing to progress with the Asset Replacement Programme (ARP) which is the replacement of columns as they become life expired.

ARP Works programmed for Winter 2014/2015 include:

Festival Park/Etruria

Marina Way
Ridgehouse Drive
Festival Way

Etruria Road, Hanley

Etruria Road is the main road from Cobridge to Newcastle. It is a busy road encompassing the flyover in Etruria. A major project will see the replacement of existing street lighting columns and high masts with new LED lighting columns and LED high masts.

Before and after photos of rear alleyway in Fenton following installation of street lighting. Since the beginning of the PFI programme SSE have lit over 40km of previously unlit back roads.

9 – Health and Safety

SSE Enterprise Lighting has been presented a Silver RoSPA award

SSE Enterprise Lighting has been presented a Silver RoSPA award for Occupational Health and Safety in 2014 – its 9th consecutive award. The Electrical and Instrumentation division received third place in the 2014 'Engineering Construction Industry' sector, following on from their 20 consecutive Gold Awards.
The high performance of SSE Enterprise Lighting's specialist Electrical and Instrumentation division is particularly notable as the majority of the E&I work is carried out in extremely hazardous environments.

The UK's family safety charity, RosPA, is dedicated to saving lives and reducing injuries. The RoSPA awards, dating back 58 years, recognise commitment to continuous improvement in accident and ill health prevention at work. The scheme is open to businesses and organisations of all types and sizes across the UK and overseas.

David Rawlins, RoSPA's award manager said: "SSE Contracting has shown that it is committed to striving for such continuous improvement and we are delighted to honour it through the presentation of an award."

BE SAFER

The first core value of SSE is Safety. SSE is proactive in promoting health and safety amongst it's staff. This is achieved using the following tools:

Site Safety Inspections – SSE managers in Stoke on Trent carried out over 110 inspections at work sites across the city during the period covered in this report. Operatives are visited on site and are rigourously assessed over several areas including the wearing of PPE, use of tools and equipment and their risk and hazard awareness.

Near Miss/hazard reports – These are reports of a situation which could have the potential to cause damage or injury. SSE staff in Stoke on Trent completed over 250 of these reports in the report's time period. The hazards reported can fall into three main categories.
Safety: Including slipping and tripping, dangerous dogs and electricity.
Health: Use of vibrating tools and exposure to noise and hazardous substances.
Environment: Safe storage and disposal of waste and impact on wildlife.
These reports serve both to raise awareness of everyday situations and encouraging staff to speak to managers should the report require further investigating or escalation.

Toolbox Talks – Staff are regularly briefed in training sessions on incidents that have occurred both within SSE and externally. Toolbox talks delivered during this period range from 'Electric shocks from columns', 'Working at height' to 'Selecting the correct gloves for the job'.

Competency Portfolios – Each SSE operative has a comprehensive training manual known as a competency portfolio which is monitored by ASLEC (The Association of Signals, Lighting and other Highway Electrical Contractors). These portfolios ensure that each operative that works for SSE is competent in the work that they are undertaking.
Operatives receive extensive training throughout the course of each year which is a major factor in our exemplary safety record since the start of our PFI partnership with Stoke on Trent City Council.

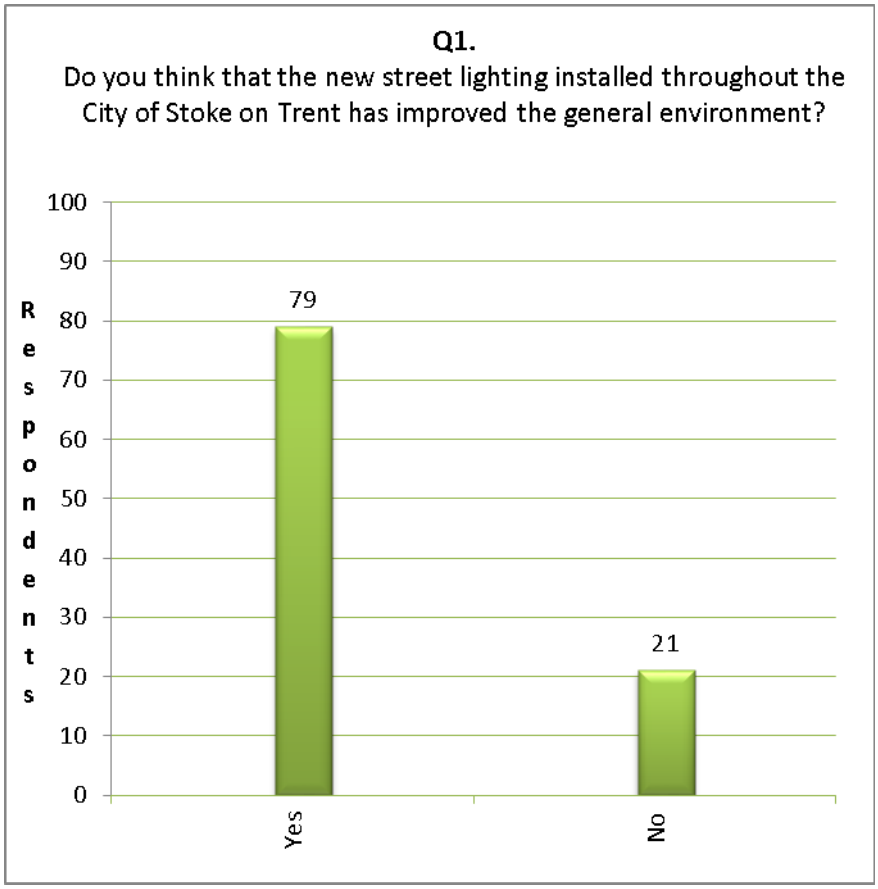
The Safety Family
It's the way we do things

10 – Customer Feedback

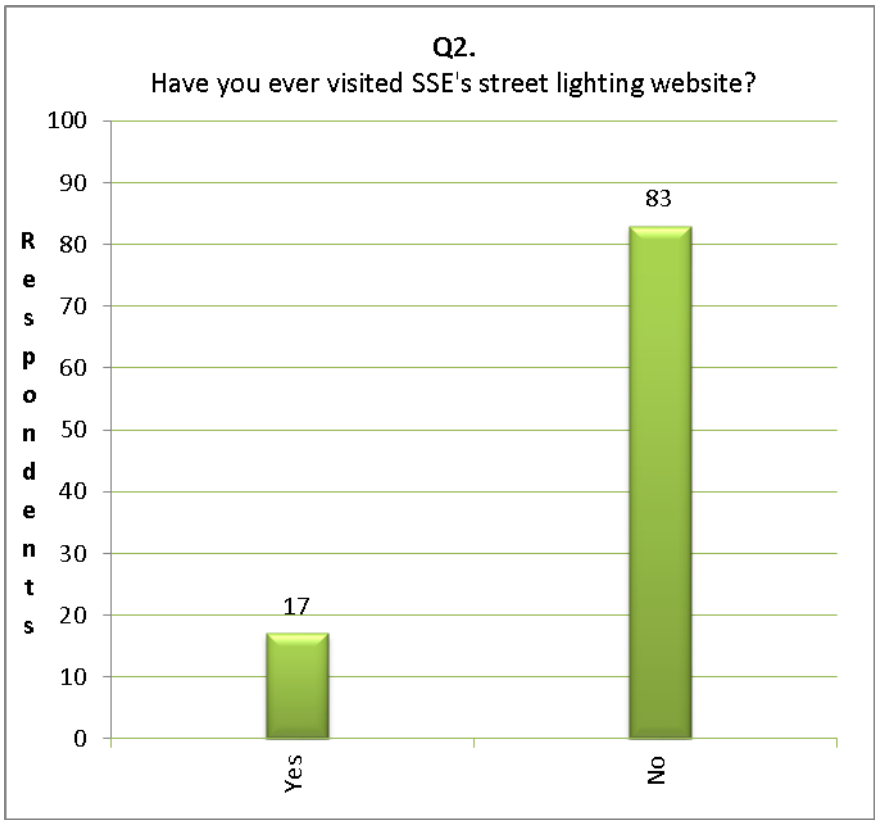
As part of our commitment to customer service we carried out our annual survey to gauge the level of public satisfaction with our services.

100 completed questionnaires were received and the results are shown below. A full copy of the questionnaire can be found in Appendix 2 at the end of this report.

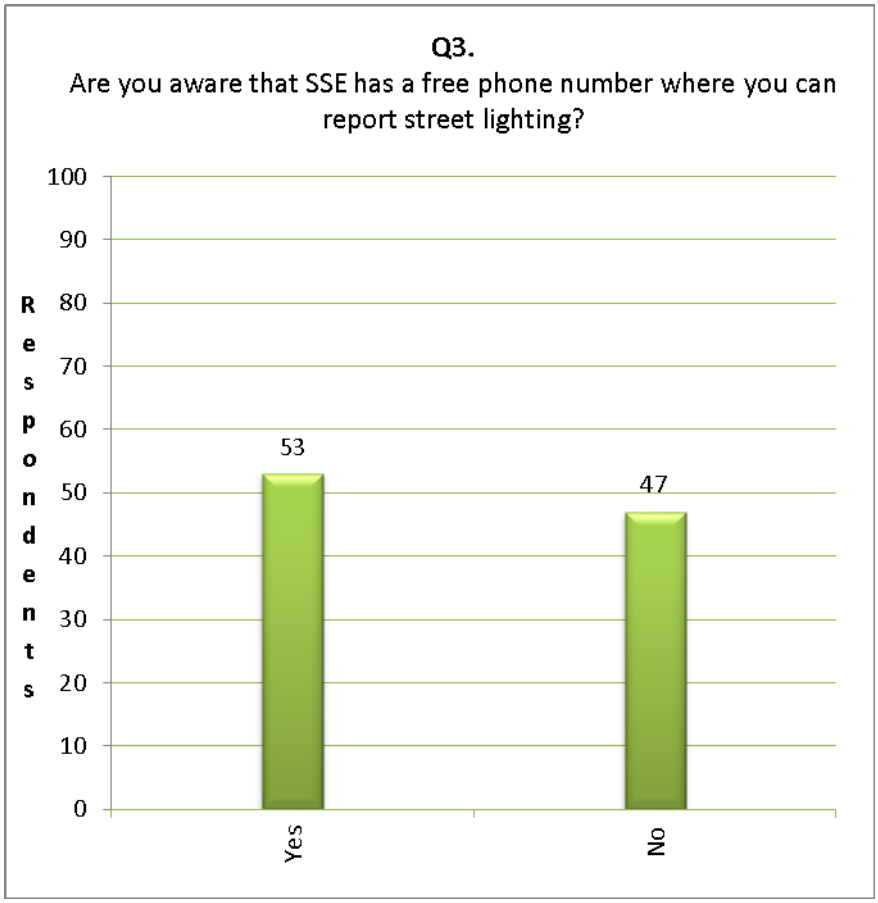
Do you think that the new street lighting installed throughout Stoke on Trent has improved the general environment?	No of respondents
Yes	**79**
No	**21**



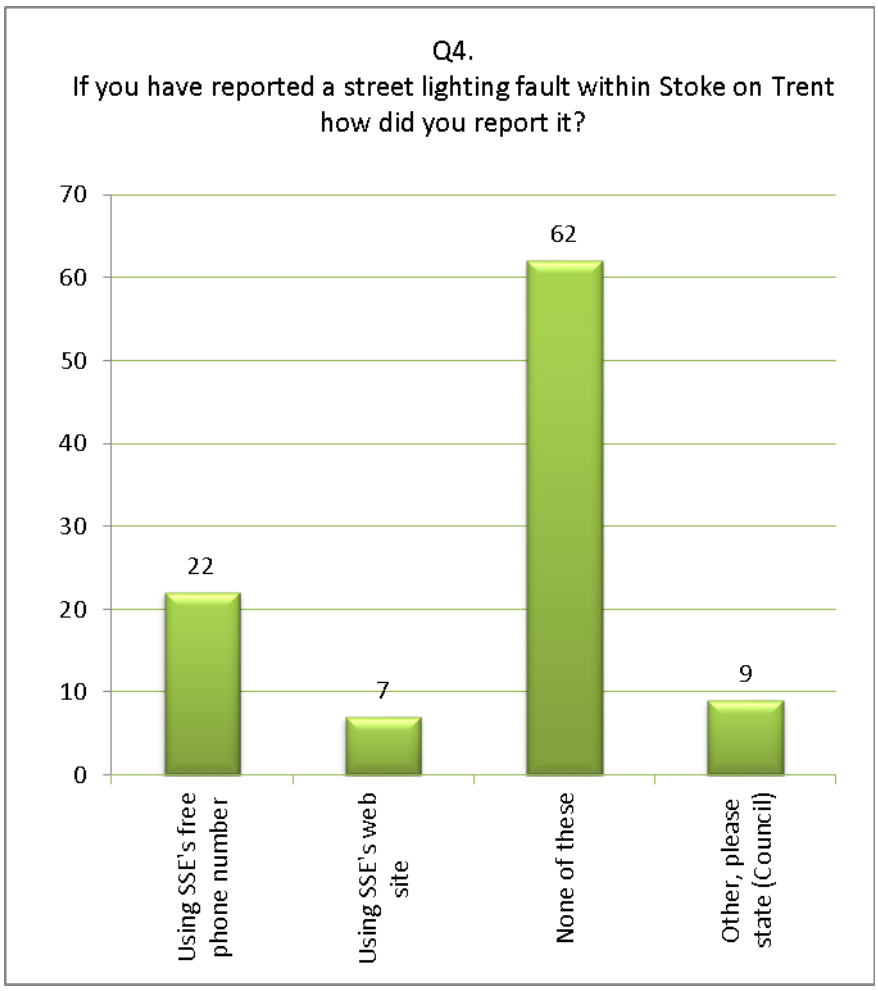
Have you ever visited SSE's street lighting website?	No of respondents
Yes	17
No	83



Are you aware that SSE has a Freephone number where you can report street lighting?	No of respondents
Yes	53
No	47

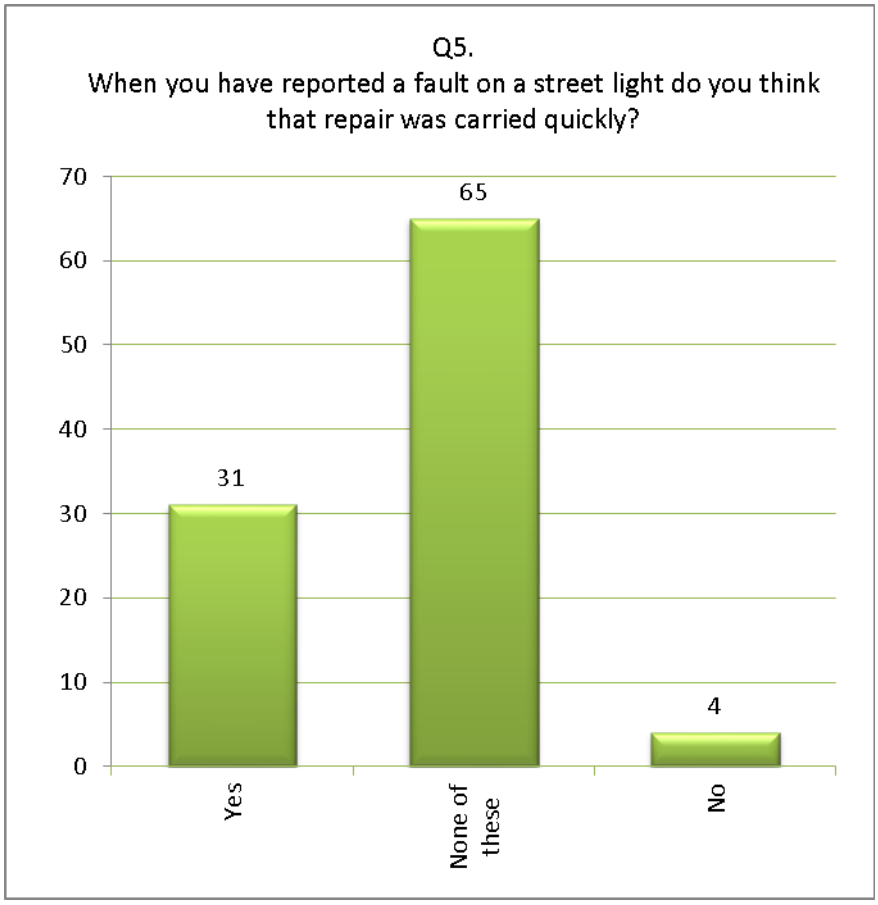


If you have reported a street lighting fault within Stoke on Trent, how did you report it?	No of respondents
SSE Freephone number	22
SSE website	7
Other (via local council)	9
Never reported	62

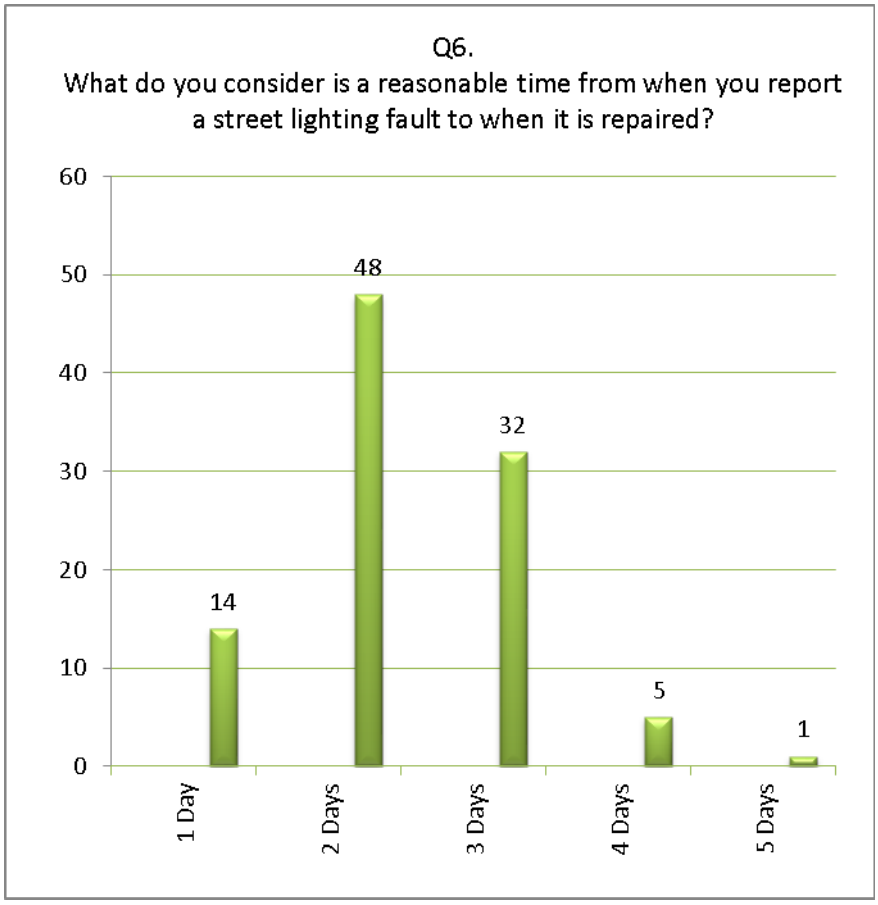


With regard to the feedback received from Q3 & Q4, SSE are aware that we need to raise the awareness of the ways of reporting faulty street lighting. We will shortly begin renumbering all of our street furniture, ward by ward. We are redesigning the labels used to number the equipment to include our Freephone number and our website details.

When you have reported a fault on a street light, do you think that the repair was carried out quickly?	No of respondents
Yes	31
No	4
Never reported	65



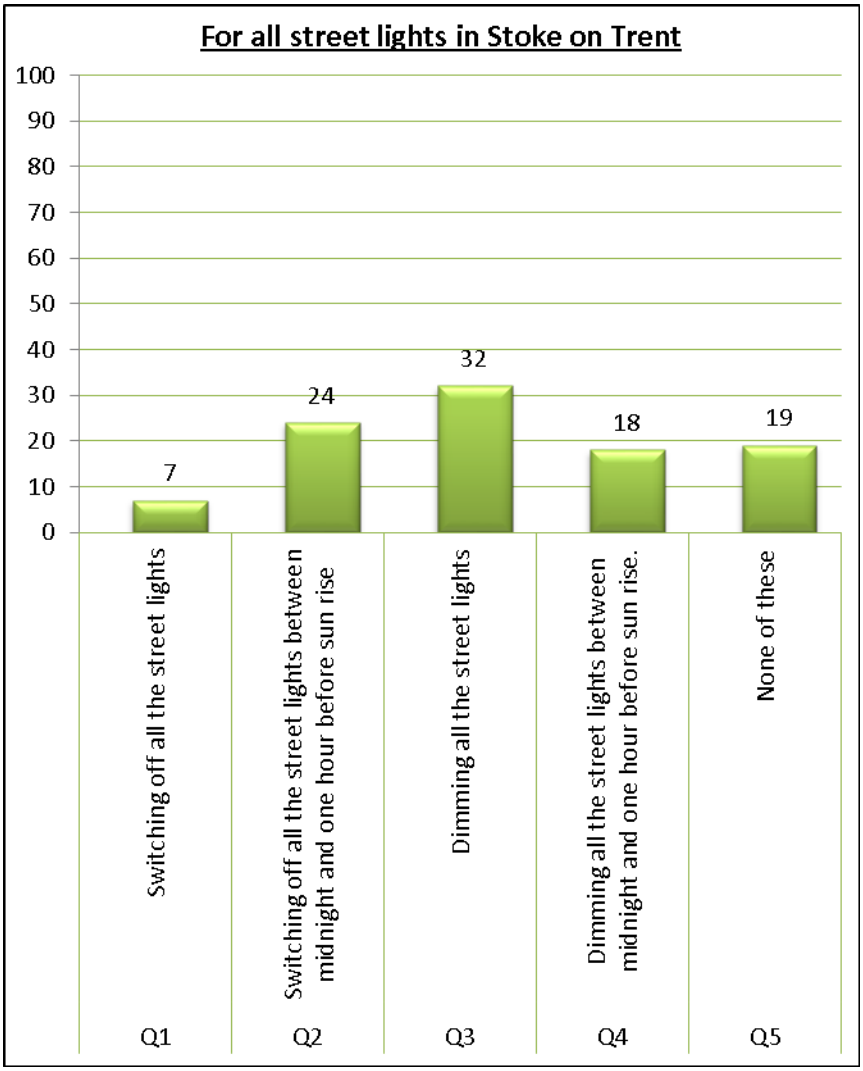
What do you consider is a reasonable time from when you a report a street lighting fault to when it is repaired?	No of respondents
1 day	14
2 days	48
3 days	32
4 days	5
5 days	1



Whilst SSE strive to repair all faults as quickly as possible, due to the growing amount of street lighting assets that we maintain, we do not have the resources to guarantee to repair faults within two days.

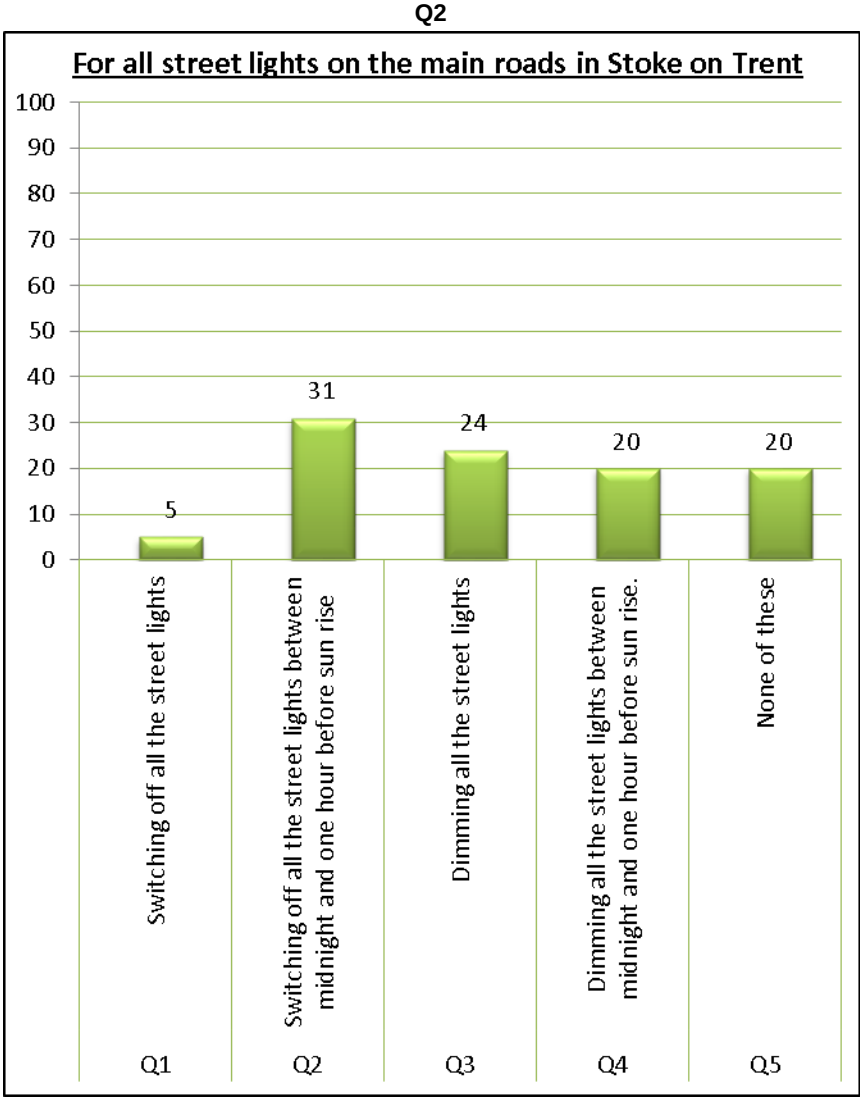
Reducing CO2 emissions, energy consumption and costs

For all street lights in Stoke on Trent, would you be in favour of:	No of respondents
Switching off all street lights	7
Switching off all street lights between midnight and one hour before sunrise	24
Dimming all the street lights	32
Dimming all street lights between midnight and one hour before sun rise	18
None of these	19

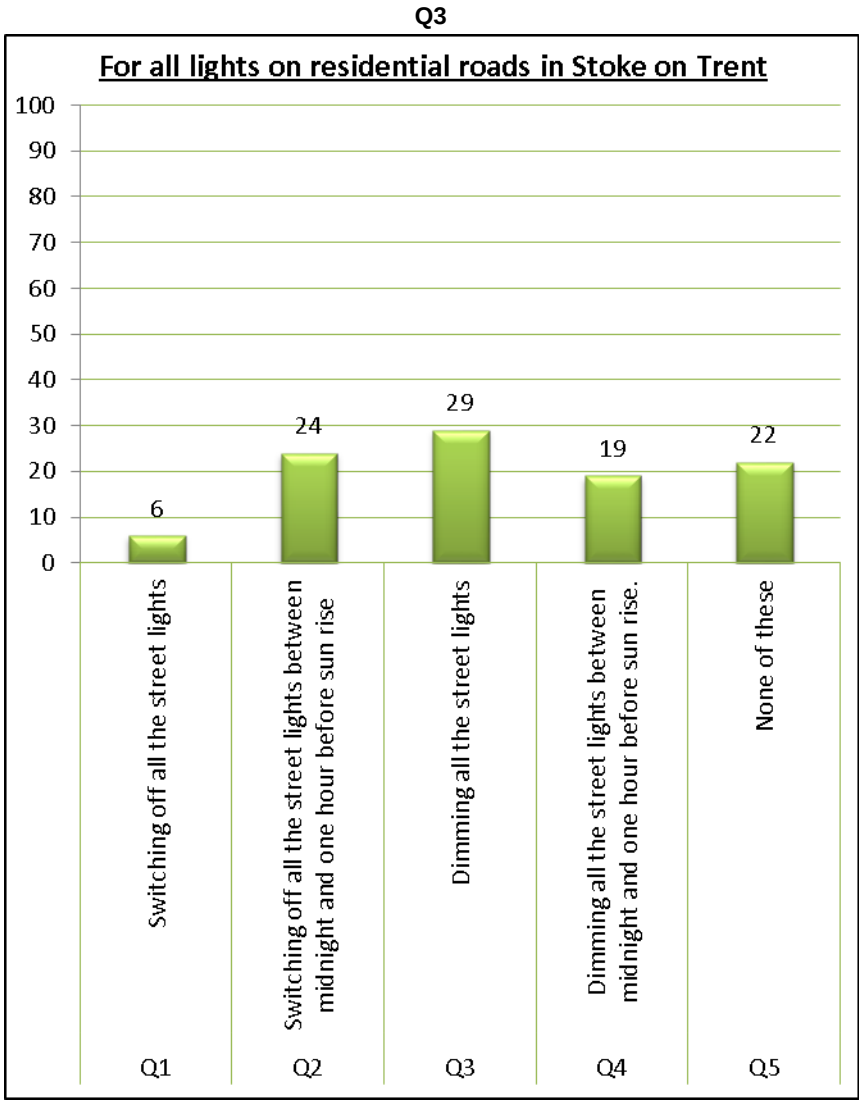


For all street lights on main roads in Stoke on Trent, would you be in favour of:	No of respondents
Switching off all street lights	5
Switching off all street lights between midnight and one hour before sunrise	31
Dimming all the street lights	24
Dimming all street lights between midnight and one hour before sun rise	20
None of these	20

Q2

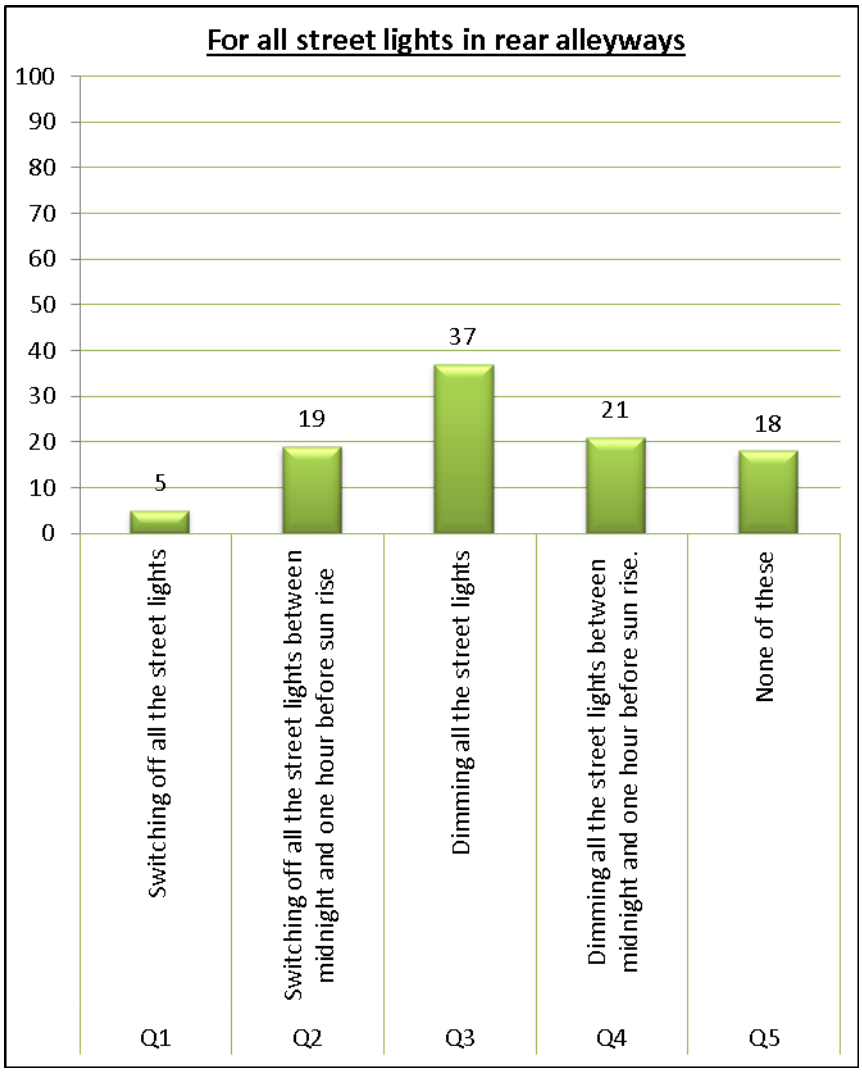


For all street lights on residential roads in Stoke on Trent, would you be in favour of:	No of respondents
Switching off all street lights	6
Switching off all street lights between midnight and one hour before sunrise	24
Dimming all the street lights	29
Dimming all street lights between midnight and one hour before sun rise	19
None of these	22



For all street lights in rear alleyways in Stoke on Trent, would you be in favour of:	No of respondents
Switching off all street lights	5
Switching off all street lights between midnight and one hour before sunrise	19
Dimming all the street lights	37
Dimming all street lights between midnight and one hour before sun rise	21
None of these	18

Q4



11 – Continuous Improvement

SSE is keen to improve our service by implementing the use of new and innovative equipment.

Anti-Vandal Cells

Anti -Social behaviour is an ongoing challenge to the service we provide. Vandalism of street lighting equipment remains a problem which necessitates the use of forward thinking and innovative equipment.
In an attempt to help combat vandalism of lanterns SSE are using Microstar cells in some streets, alleyways and play areas where this is a problem. Instead of using standard nema sockets fitted with a removable cell, these mini photocells are drilled and hardwired directly into the lantern casing leaving no removable parts. Thus proving harder to steal and offering increased resistance to vandalism. As well as being low in power consumption, this reduces the amount of maintenance and repairs required, in turn reducing the amount of hours that the column is out of lighting.

TAMTORQUE sign fixing clips

These sign fixing clips are safe, vandal resistant and prevent damage to columns.

The clips have an auto-locking safety buckle that ensures that the free end of the band is safe and tidy, reducing the risk of injury to the public. They have a tamper resistant screw that can only be released with a unique screw bit, thus lessening the risk of vandalism. Finally the clips have no sharp edges which can snag or cut the object to which they are attached. As we have hundreds of signs throughout the city fixed to posts and columns the use of these clips will significantly reduce damage to our street furniture.

Luma LED lanterns

SSE have installed these LED lanterns on several pedestrian crossings within the city.

The flat design gives better visibility on crossings and they can deliver energy savings of over 50% with related reduction in CO2 emissions.

They help to provide better visibility on crossings as due to the design of the lantern, the light is directed downwards with no light 'escaping' outwards or upwards. This avoids 'light pollution' which, put simply, is light that is allowed to go where it is not wanted. Light pollution is not only wasted energy but can also be detrimental to road users. 'Glare' is the effect when eyes are exposed to bright light. It blinds you temporarily blinds you and the eyes cannot see other objects around you. Street lights are one of the most common causes of glare.

Pedestrian crossings on Huntbach Street and Town Road in Hanley are working examples of the working Luma lantern.

Centrenols

SSE are using Centrenols to reduce maintenance. Centrenols are an illuminated post and beacon module with a fully LED light source for increased visibility and pedestrian safety.

The LED light source has a 50,000 hour burn time which reduces the need for maintenance
visits.

APPENDIX 1
Innovation Report

Street Lighting:

Innovations Proposal Paper for the Reduction in Energy & Carbon Emissions

A Report By

Introduction

SSE Contracting has been in discussion with the Council and various lantern manufacturers and has developed a number of options to trial for residential areas including retrofit LED technologies and/or retrofitting electronic dimmable control gear and white light lamps.

SSE Contracting and the Council have agreed a trial site area to set up for these different light source assessments.

These trial area installations are to be monitored and assessed by the Council such that, jointly, the most appropriate solution for specific areas of the city and the PFI contract framework can be identified.

The LED Trial Site

The trial site area identified includes Penkville Street Back Lane, Shelburne Street, Boothenwood Terrace, Munro Street, and James Street.

The proposals are to change the existing SON units to a white light LED source. Philips has developed a retro-fit LED module for the Iridium luminaire. This is available in both an ECO 24LED and GRN 16LED option. The trial areas selected will also demonstrate whether an LED solution can be applied to both high and low crime areas.

To establish the most appropriate light levels, designs for the above roads have been carried out referring to BS5489-1: 2013 COP for the Design of Road Lighting and ILP Guide PLG03 Lighting for Subsidiary Roads for both high and low crime areas. To assist the evaluation and differentiate between high and low crime areas different adjacent streets will have different solutions, this will include utilising both Neutral and Cool White LED's in both areas. Providing both options will give an opportunity for feedback from local residents and assessment by the Council.

One of the trial areas, one of the back lanes, is proposed also be converted to part-night lighting for assessment.

It is proposed to install the trial area lanterns with Mayflower CMS controls such that; in addition to the trial of the retrofit lighting units themselves, detailed trials of potential residential dimming regimes can be flexibly and cost effectively undertaken to assess residents reactions before adopting any proposals city-wide.

Bollard de-illumination and retro-fitting photo-electric cells

Proposals have also been made, separately to the trial area proposal, in relation to bollard de-illumination or retro-fitting of photo-electric cell options. These proposals are not dealt with in this paper and are being pursued separately with the Council by SSE Contracting depot staff.

Other Options – the next Phase

There are also several future lantern options currently under consideration by SSE Contracting should the LED trial prove unsuccessful. We are keen to assess how best to exploit new Philips retro-fit lanterns on the Stoke network. These opportunities could be useful to apply to the Stoke

inventory once the lantern photometries are confirmed. These options are to be pursued as the next phase and are discussed in Annex 1.

The Next Step

SSE Contracting invites the Authority to approve the installation specification for the trial area and to agree the timescales for both installation and the necessary monitoring and resident consultation and feedback sessions to identify the most appropriate solutions to adopt city wide.

SSE Contracting will then analyse the costs and energy saving implications of city wide implementation.

The Technical Options proposed for the Residential Trial Areas

In the evaluations below, street by street detail on energy and carbon usage is compared between existing lamp and control gear to the proposed retrofit LED option. The lantern manufacturer indicates that the required range of retro-fit modules will be available from January 2014 and, therefore, installations can take place in summer 2014.

Each of the figures is annual, based on implementation of the quantity of existing units.

Energy price is based on 10.12p/KWh, the current buying price. CO_2 savings to the Council are also shown.

Savings are calculated on the basis of total savings and do not take account of any sharing mechanisms which may exist in the contract.

Capital costs do not include any funding/borrowing costs.

To assist the impact on inventory-wide implementation across residential areas we have also modelled illustrative forecast energy & carbon savings and capital funding requirements across 14,000 units. Assessed lighting levels are to P4 in high crime and P5 in low crime areas.

The payback period is calculated on the basis that all apparatus has been installed and full savings are achieved. However there will of course be a gradual increase in savings during the replacement period if wide scale implementation is adopted, this is not factored into these calculations.

Option 1 – Penkville Street Back Lane: convert to part-night lighting

Convert five existing 24w PLL lanterns to part-night lighting. Switch off between the hours of midnight and 5.00a.m.

Table 1: part-night lighting cost analysis

	Cost/Benefit
Capital Replacement Quantity	5
Capital Replacement Unit Cost	£17.85
Total Capital Cost	£89.25
Energy Saving Per Year (Kwh)	279 Kwh
Annual CO2 Saving	0.366 Tonnes
Energy Saving Per Year (£)	£28.25
Payback Period	3.16 yrs

Option 2a – Shelburne Street: Convert to LED Neutral White

Convert four existing 70w SON lanterns to Neutral White LED. Lighting level assessed to P4, enables unit to be lit at 90% light output, equivalent to 35w with CLO.

We have also included an alternative option below to allow dimming between the hours of midnight to 5.00a.m. Reduced dimmed lighting level to be to P5, equivalent to 21w, 55% light output. This can be implemented for on-site assessment through the Mayflower CMS system being installed in the trail area.

Table 2: Shelburne Street

ECO43 WSO 740 Neutral White LED	Cost/Benefit	
	On all night	Dimmed midnight to 05.00am
Capital Replacement Quantity	4	4
Capital Replacement Unit Cost	£197.72	£197.72
Total Capital Cost	£790.86	£790.86
Energy Saving Per Year (Kwh)	908 Kwh	1003 Kwh
Annual CO2 Saving	0.488 Tonnes	0.538 Tonnes
Energy Saving Per Year (£)	£91.88	£101.47
Payback Period	8.6 yrs	7.8 yrs

Option 2b – Boothenwood Terrace: Convert to LED Cool White

Convert three existing 70w SON lanterns to Cool White LED. Lighting level assessed to P4, enables unit to be lit at 80% light output, equivalent to 31w with CLO.

We have also included an alternative option below to allow dimming between the hours of midnight to 5.00a.m. Reduced dimmed lighting level to be to P5, equivalent to 17w, 43% light output. This can be implemented for on-site assessment through the Mayflower CMS system being installed in the trail area.

Table 3: Boothenwood Terrace

ECO45 WSO 657 Cool White LED	Cost/Benefit	
	On all night	Dimmed midnight to 05.00am
Capital Replacement Quantity	3	3
Capital Replacement Unit Cost	£197.72	£197.72
Total Capital Cost	£593.16	£593.16
Energy Saving Per Year (Kwh)	730 Kwh	802 Kwh
Annual CO2 Saving	0.392 Tonnes	0.430 Tonnes
Energy Saving Per Year (£)	£73.92	£81.12
Payback Period	8.0 yrs	7.3 yrs

Option 2c – Munro Street: Convert to LED Neutral White

Convert four existing 70w SON lanterns to Neutral White LED. Lighting level assessed to P5 at 100% light output, equivalent to 18w with CLO.

We have also included an alternative option below to allow dimming between the hours of midnight to 5.00a.m. Reduced dimmed lighting level to be to P6, equivalent to 13w, 70% light output. This can be implemented for on-site assessment through the Mayflower CMS system being installed in the trail area.

Table 4: Munro Street

GRN20 WSO 740 Neutral White LED	Cost/Benefit	
	On all night	Dimmed midnight to 05.00am
Capital Replacement Quantity	4	4
Capital Replacement Unit Cost	£188.63	£188.63
Total Capital Cost	£754.50	£754.50
Energy Saving Per Year (Kwh)	1,189 Kwh	1,222 Kwh
Annual CO2 Saving	0.638 Tonnes	0.656 Tonnes
Energy Saving Per Year (£)	£120.28	£123.71
Payback Period	6.3 yrs	6.1 yrs

Option 2d – James Street: Convert to LED Cool White

Convert four existing 70w SON lanterns to Cool White LED. Lighting level assessed to P5, enables unit to be lit at 90% light output, equivalent to 16w with CLO.

We have also included an alternative option below to allow dimming between the hours of midnight to 5.00a.m. Reduced dimmed lighting level to be to P6, equivalent to 12w, 65% light output. This can be implemented for on-site assessment through the Mayflower CMS system being installed in the trail area.

Table 5: James Street

GRN21 WSO 740 Cool White LED	Cost/Benefit	
	On all night	Dimmed midnight to 05.00am
Capital Replacement Quantity	4	4
Capital Replacement Unit Cost	£188.63	£188.63
Total Capital Cost	£754.50	£754.50
Energy Saving Per Year (Kwh)	1,222 Kwh	1,249 Kwh
Annual CO2 Saving	0.656 Tonnes	0.671 Tonnes
Energy Saving Per Year (£)	£123.63	£126.36
Payback Period	6.1 yrs	6.0 yrs

Retro-fit LED, inventory wide implementation on residential areas

Modelled below, for illustrative purposes, are forecast energy & carbon savings and capital funding requirements for implementation across 14,000 residential area units.

For this exercise Neutral White has been selected as a 'safe' option. Following the trial site evaluation, if the retro-fit LED proposal is agreed upon these figures can be revised to reflect the final preferred solution.

To convert 14,000 existing 70w SON lanterns to Neutral White LED.

Also included is an alternative option to allow dimming between the hours of midnight to 5.00a.m. Reduced dimmed lighting levels to be to P5 and P6 in high / low crime areas respectively. If the Council confirms that a dimming regime is acceptable, then the agreed dimming regime can be pre-programmed by the manufacturer during assembly prior to despatch.

Table 6: Wide scale residential implementation

Neutral White LED High Crime Areas - ECO43 WSO 740 Low Crime Areas – GRN20 WSO 740	Cost/Benefit	
	On all night	Dimmed midnight to 05.00am
Capital Replacement Quantity	14,000	14,000
Average Capital Unit Cost	£193,17	£193.17
Total Capital Cost	£2,704,394	£2,704,394
Energy Saving Per Year (Kwh)	3,668,903 Kwh	3,893,939 Kwh
Annual CO2 Saving	1,970 Tonnes	2,091 Tonnes
Energy Saving Per Year (£)	£371,292	£394,066
Payback Period	7.3 yrs	6.9 yrs

Next Steps

With Council approval, the proposals for the trial area will be implemented (Options 1 & 2 a-d). Assessment and suitability of the 'white' light lighting levels and perception can then be undertaken. This will also provide the Council with the opportunity to consider appropriate dimming options which may be appropriate for city wide implementation.

SSE Contracting would fund the residential trials, involving the 5 units and including the Mayflower installations.

Contractual and funding options for a city-wide implementation of the solutions identified will be considered when the balance of capital cost and energy and carbon savings are fully established following assessment of the results of the trial. These assessments will need to include dimming options.

In addition, further discussions are proposed for achieving energy and carbon savings in relation to the traffic routes.

Other Options

Replacing existing control gear and lamp sources

Two different options are currently being evaluated by SSE Contracting should the LED trial prove impractical:-

Option 1

Philips has introduced an '**Edison Screw' version of their Cosmopolis lamp**. This will retro-fit into the existing 50 watt and 70 watt SON Philips Iridium lanterns. This option will involve replacing the existing magnetic control gear with electronic 45 watt and 60 watt dimmable gear and lamps. Photometric performance is currently being assessed by Philips. Once the photometric data is available this option can be further assessed for suitability. Anticipated costs and energy savings are indicated below;

Table 7: replacing existing 70w and 50w SON control gear & lamp source – Philips option

	Cost/Benefit
Capital Replacement Quantity	18,000
Capital Replacement Unit Cost	£91.52
Total Capital Cost	£1,647,105
Energy Saving Per Year (Kwh)	1,702,796 Kwh
Annual CO2 Saving	914 Tonnes
Energy Saving Per Year (£)	£172,322
Payback Period	9.6 yrs

The calculations above are based on the number of luminaire conversions detailed in table 8 below:

Table 8: Lamp/control gear conversions

Luminaire Conversions	
Lamp Source	**Quantity**
70w SON	14,000
50w SON	4,000
Total	**18,000**

Option 2

The second option is to trial the **Osram 'Powerball HCI-TT' 50 watt and 70 watt lamp and Powertronic Ballast.** As above, photometric performance is currently being assessed. Costs and

energy savings are similar to the Philips option above and can be further assessed once photometric data is available to assess suitability.

Traffic Route Lantern Retrofit Technical Options

The Philips Edison Screw Cosmopolis lamp may now also be a realistic option for traffic routes. We are already actively pursuing this possibility with Philips. Currently there is very limited information and photometric data available. Upon receipt of required information to carry out an evaluation we will explore this option in more detail with the Council.

As well as the Cosmopolis option, retro-fitting of electronic control gear to existing lanterns and lamp source may now be more viable with increased performance and availability of electronic control gear. For this option to be truly viable, dimming should be considered. This option needs further discussion with the Council to agree a proposal with regard to an acceptable dimming level/regime.

The table below indicates possible savings by replacing the existing magnetic control gear with electronic dimmable control gear with a dimming option of 25% (power).

Table 9: replacing existing 250w and 150w SON control gear – Traffic Routes

	Cost/Benefit	
	On all night	Dimmed 25% midnight to 05.00am
Capital Replacement Quantity **150w – 2,100 units** **250w – 700 units**	2,800	2,800
Average Capital Unit Cost	£99.33	£99.33
Total Capital Cost	£278,112	£278,112
Energy Saving Per Year (Kwh)	280,223 Kwh	500,522 Kwh
Annual CO2 Saving	150.48Tonnes	268.78 Tonnes
Energy Saving Per Year (£)	£28,358	£50,652
Payback Period	9.8 yrs	5.5 yrs

APPENDIX 2
SURVEY QUESTIONNAIRES

Street lighting Survey 2014 - SSE

1) Do you think that the new street lighting installed throughout the City of Stoke on Trent has improved the general environment?

   a. Yes
   b. No

2) Have you ever visited SSE's street lighting website?

   a. Yes
   b. No

3) Are you aware that SSE has a free phone number where you can report street lighting?

   a. Yes
   b. No

4) If you have reported a street lighting fault within Stoke-on-Trent how did you report it?

   a. Using SSE's free phone number
   b. Using SSE's web site
   c. Other, please state

5) When you have reported a fault on a street light do you think that repair was carried quickly?

   a. Yes
   b. No

6) What do you consider is a reasonable time from when you report a street lighting fault to when it is repaired?

7) If you have ever been in contact with a member of SSE, please rate on a scale of 1 – 10 the way in which your query was dealt with. (1 is poor, 10 is excellent).

To reduce CO2 emissions, energy consumption and costs would you be in favour of:

For all street lights in Stoke-on-Trent

Q1 – Switching off all the street lights.
Q2 – Switching off all the street lights between midnight and one hour before sun rise.
Q3 – Dimming all the street lights.
Q4 - Dimming all the street lights between midnight and one hour before sun rise.

For all street lights on the main roads in Stoke-on-Trent

Q1 – Switching off all the street lights.
Q2 - Switching off all the street lights between midnight and one hour before sun rise.
Q3 – Dimming all the street lights.
Q4 - Dimming all the street lights between midnight and one hour before sun rise.

For all streets on residential roads in in Stoke-on-Trent

Q1 – Switching off all the street lights.
Q2 - Switching off all the street lights between midnight and one hour before sun rise.
Q3 – Dimming all the street lights.
Q4 - Dimming all the street lights between midnight and one hour before sun rise.

For all street lights in rear alleyways

Q1 – Switching off all the street lights.
Q2 - Switching off all the street lights between midnight and one hour before sun rise.
Q3 – Dimming all the street lights.
Q4 - Dimming all the street lights between midnight and one hour before sun rise.