Energy Solutions Limited

Lighting & Grid

STAFFORDSHIRE COUNTY COUNCIL
HIGHWAY LIGHTING
PRIVATE FINANCE INITIATIVE CONTRACT

ANNUAL SERVICE REPORT FOR PERIOD
19TH MAY 2020 TO 18TH MAY 2021

Staffordshire County Council

Introduction

This report is prepared by the Service Provider, E.ON Energy Solutions Limited, in accordance with its obligations contained under Schedule 4, Part B.

Contents

1.0 Introduction by Staffordshire County Council

Prior to the commencement of the Street Lighting Private Finance Initiative (PFI) contract Staffordshire County Council was responsible for 99,000 units of street lighting equipment. With an average design life for a streetlight of 25 - 30 years and with 24 % of streetlights age expired, there was significant risk to the public from street lighting column failure. The annual investment budget fell considerably short of providing an acceptable solution to a rapidly degrading lighting stock and hence a longer-term solution was developed in the form of a PFI. In May 2003 Lighting for Staffordshire commenced a programme of renewal and maintenance works for the 25-year term PFI contract. This would ensure the condition of the County's road lighting stock would be maintained at the appropriate level for the foreseeable future.

The Project will therefore provide a continuous investment programme that will halt and reverse equipment degradation through the provision of a modern standard of road lighting which is and will continue to be designed to provide an economic and effective level of lighting whilst protecting and enhancing the environment.

The PFI project forms an integral part of Staffordshire County Council's priority outcomes and aims by the provision of good lighting and an efficient lighting service to support our Vision – A county where big ambitions, great connections and greener living give everyone the opportunity to prosper, be healthy and happy.

Cllr David Williams
Cabinet Member for
Highways and Transport

Staffordshire County Council

2.0 Project Overview

The Staffordshire Highway Lighting PFI project launched in May 2003 as a partnership between Staffordshire County Council and Lighting for Staffordshire. Structured maintenance and replacement regimes target the County's 99,000+ streetlights, illuminated signs and bollards to provide longevity to assist in improving road safety, reductions in crime and the fear of crime.

Maintenance activities including timely lamp changes, lantern and bollard cleaning, periodic electrical and structural inspections keep the assets in good working order whilst those assets reaching the end of their maintainable life are programmed for replacement.

24 hours a day, 365 days a year coverage is provided as standard to ensure that those unforeseen emergency events that could cause harm to residents or property are dealt with quickly and professionally to reduce risks.

Performance monitoring of the services provided is ongoing and continuous by Lighting for Staffordshire, Staffordshire County Council and Government appointed National Auditors.

This report concentrates on the targets and achievements of year 13 of the Annual Apparatus Renewal Programme (AARP), 19 May 2020 to 18 May 2021 as well as a look ahead to our future plans and aspirations.

As was the case last year, one of the most noticeable achievements of 2021 is that all contractual activities continued throughout the global COVID-19 pandemic. Not only did the PFI experience no change to service provision, but the depot moved to a new location and saw the commencement of the Invest to Save programme, which is testament to the dedication and commitment of the operations team that they continued to deliver their keyworker roles without hesitation.

As a service, E.ON held daily meetings to review services, provision, staffing and the impacts of the pandemic on our partners and suppliers to ensure that any impact on our provision was as minimal as possible. Where impacts were possible, this was communicated to relevant partners such as Staffordshire County Council as quickly as possible. Similarly, our partners communicated quickly with us to ensure our effective collaborative approach addressed potential impacts as quickly and timely as possible.

Paul Slade
Regional Operations Manager
Energy Solutions Limited
Infrastructure Services

3.0 Introduction to E.ON

E.ON are one of the UK's leading power and gas companies - generating electricity, and retailing power and gas and, as part of the E.ON group, are the world's largest investor-owned energy service provider employing over 11,000 people in the UK and almost 79,000 worldwide.

At E.ON, we're playing a decisive role in the unprecedented transformation of the energy world. The energy system of the twentieth century is being completely reorganised. In the age of the Fourth Industrial Revolution, energy will take on a new significance and become a fundamental social issue. Energy will become a movement. And E.ON is playing an active role in solving one of humankind's most complex challenges.

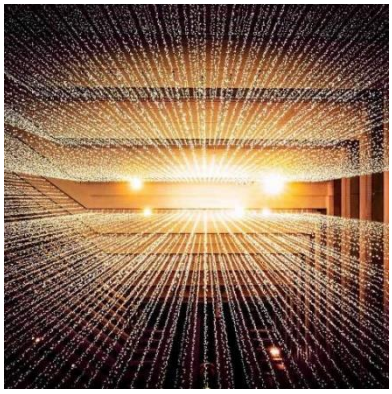
Our core businesses are helping make tomorrow's energy world more sustainable. Our energy networks are where the transition to a low-carbon energy supply is happening; they integrate renewables, connect producers and consumers, and deftly manage complex energy flows. Our customer solutions help customers of all kinds use energy more efficiently, produce their own renewable energy, and thus reduce their carbon footprint.

Putting customers at the centre of our business doesn't just mean providing them with energy solutions. It also means truly understanding them and establishing a long-term personal relationship with them.

Around 3.8 million households choose E-on for their electricity and gas making us one of the leading energy companies in the UK.

We're going to make the energy we provide to our customers smarter and sustainable. This will help our customers and society as a whole to make the world a better place. And help the energy future conserve resources.

In tomorrow's energy world, electricity from renewable sources will be available in unlimited quantities. Our role as a leading energy company is to design business models for this energy future. This will change and enrich how people live, work, and play. We'll work to ensure that people in remote regions have the same opportunities as the residents of big cities.



In today's digital age, energy consumption and the demands on the energy system are increasing continually. We're going to deploy new technologies to make energy networks and solutions—and thus cities and communities—more productive and more efficient. Energy networks will become the internet of energy, connecting people and continually creating new possibilities. Our energy networks are the platform for generating a wide variety of ideas and solutions—for our customers and our enterprise partners.

We all rely on the latest technology to power our daily lives, at E.ON we provide modern home energy solutions. From air source heat pumps, solar panel energy systems and energy efficient boilers which all help lower your home's carbon footprint to electric car chargers to help cut your carbon emissions.

Solar is one of the world's fastest growing renewable energy solutions. Adding a battery to solar panel systems allows the power created to be stored for later use, giving more self-sufficiency from the grid.

As solar power is from a renewable and sustainable source, it also reduces the carbon footprint of homes and helps to create a greener tomorrow.

The Government have outlined their ambitions to make the UK zero-carbon by 2050. A major contribution in achieving this target is the introduction of a ban on new diesel and petrol cars by 2030. With the technology of electric cars improving all the time, especially battery capacity, now is a great time to make the switch to electric.

We're creating a completely new charging experience for drivers of electric cars by launching ten Ultra-Fast Charging (UFC) stations in the UK over the next two years in partnership with EG Group. Our UFC stations can deliver up to 175kW of electricity, charging in around ten minutes for 160 miles giving you the flexibility to get out and about across the UK without the constant worry of a flat battery holding you back.

As a leader in the field of street lighting, E.On offers a comprehensive end-to-end service – from design, through installation, to maintenance and aftercare.

Whether it's upgrading an existing system or an entirely new outdoor lighting project, we can work with you to deliver exactly what you need. We're your one-stop shop for all your street lighting needs - we'll take care of all steps of the process for you.

We can design for any outdoor situation, new developments, road improvements, car parks or any amenity area. We can even redesign an existing scheme with new technology and save money. LED lighting technology uses less energy than other traditional lighting methods so you can save you money when replacing most existing scheme. With specific energy modelling, we can even anticipate the payback period.

Our teams are able to offer cyclic pre-planned maintenance services, bulk lamp clean and change, electrical testing, visual structural inspections, as well as reactive fault diagnosis and repair.

Our training provider accreditation for our Apprenticeship Programme, coupled with our positive mentoring scheme, ensures our Apprentices receive the very best training and support throughout their development. In terms of numbers for the Staffordshire PFI, 20 Apprentices have been registered since 2012 and of these, 11 have successfully completed their programmes and 9 are progressing well along their journey.

4.0 Progress Report

4.1 Asset Renewal Progress Update

Our asset renewal teams review the condition of every lamppost within the County considering their age profile to make sure that they continue to be structurally safe, economically viable to maintain and not likely to become structurally defective through age degradation or environmental factors. Those units failing any of the categories are programmed, using an additional assessment of risk, for replacement either as single units or as complete schemes where most of the lampposts in the road are affected and require replacement.

Every road throughout the County has a designated classification, which is not simply dependent upon a road being an A or B road, but also considers usage, location, speed, traffic flows, and the like. This classification is what ultimately determines the appropriate level of lighting required for that road and it is from this information that the lighting design can be determined.

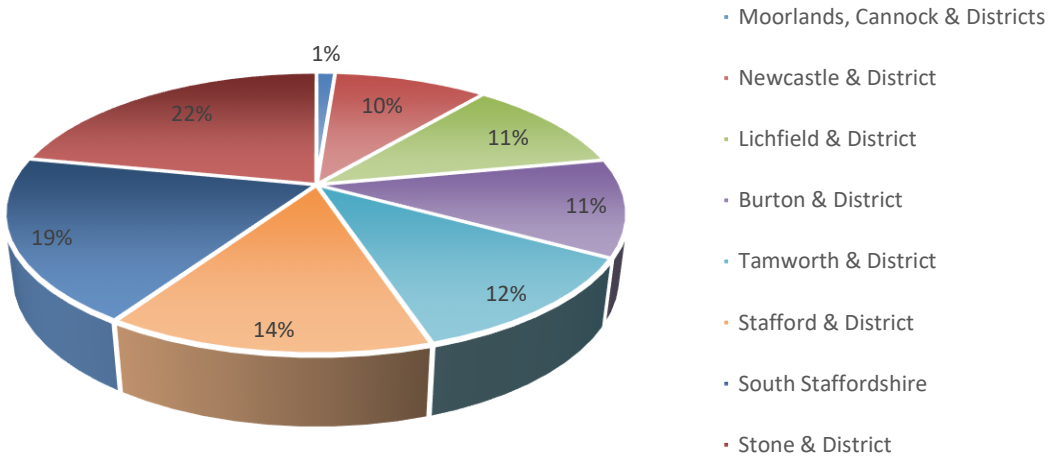
Furthermore, we can determine where we can implement dimming strategies to reduce night-time light levels and with that, the energy consumed. When considering new schemes and any alterations required to meet this, existing locations are considered to reduce unnecessary disturbance to the footpaths and ultimately the community. Where this is not possible, new locations are selected as sympathetically as possible within the existing road layout, but this may mean new positions where streetlights have not previously been.

Staffordshire remains the only operational PFI with an asset replacement programme spanning the 25-year contract term. Other contracts replace all units within an intensive 5-year programme irrespective of condition, rather than utilising the maximum life of the asset and replacing units when necessary. This method of contract delivery provides a smoother, more sustainable and affordable replacement programme when the new assets require review again in approximately 40 years.

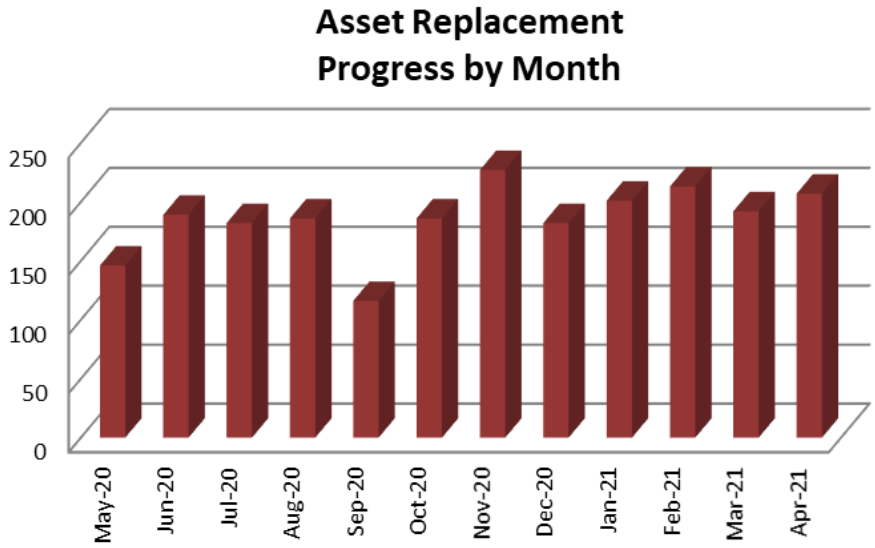
The continuous cycle of replacement has enabled us to consider new technologies as they emerge. When new products or wholesale technological advancements become available, we can consider benefits such as reductions in ongoing maintenance costs, improved lighting abilities that may reduce the number of assets requiring to be installed, reduced power consumption which reduces energy costs alongside other factors that may detrimentally affect how we deliver quality into the lighting stock.

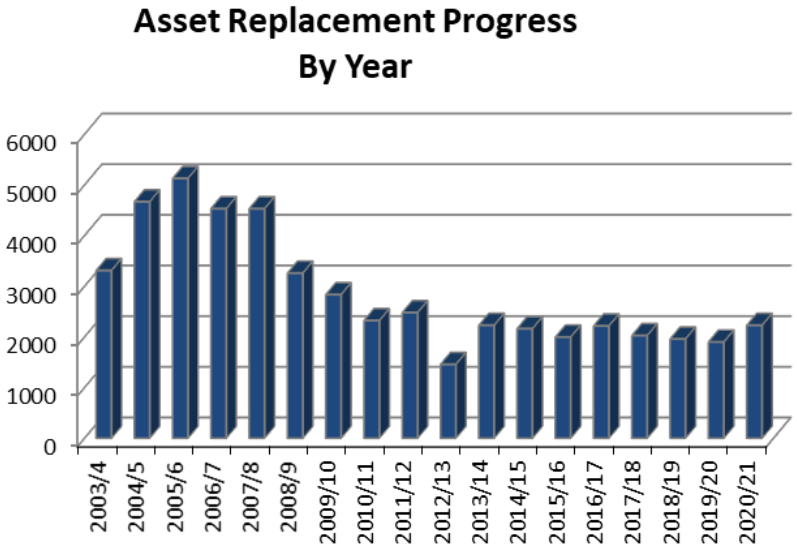
Our delivery objective has always been to ensure that our replacement programme is distributed throughout the County over each period as opposed to concentrating solely in one district or area. This allows the benefits the new lighting brings to be displayed regionally and reduces prolonged disruption in any area.

The following activity report shows the districts across the region that have benefited from new column installation in the last year, with the Moorlands and Cannock districts being combined;



To date we have replaced more than 51,000 streetlights and the graphs below indicate the number of columns replaced each month during the 2020/2021 period along with the overall street lighting replacement progress since contract commencement;





4.2 Programme Delivery

Our planned delivery programme is updated every three months and to ensure this is visible and readily available, it is shared with Staffordshire County Council, and other district and borough councils within the county.

Columns are primarily selected for replacement in accordance with their age, but we also understand that some columns are more resilient than others and plan our anticipated working patterns by using data collected over the past 18 years, data collected by the Authority prior to project commencement, and our extensive industry knowledge.

We have completed a full programme review to determine a general programme of commencement for each and every road up until the contract conclusion in 2028. Whilst this may be subject to small changes through accelerated deterioration, planning in line with other County developments and the like, we can now provide better information for any interested party regarding our whereabouts for the remainder of the project.

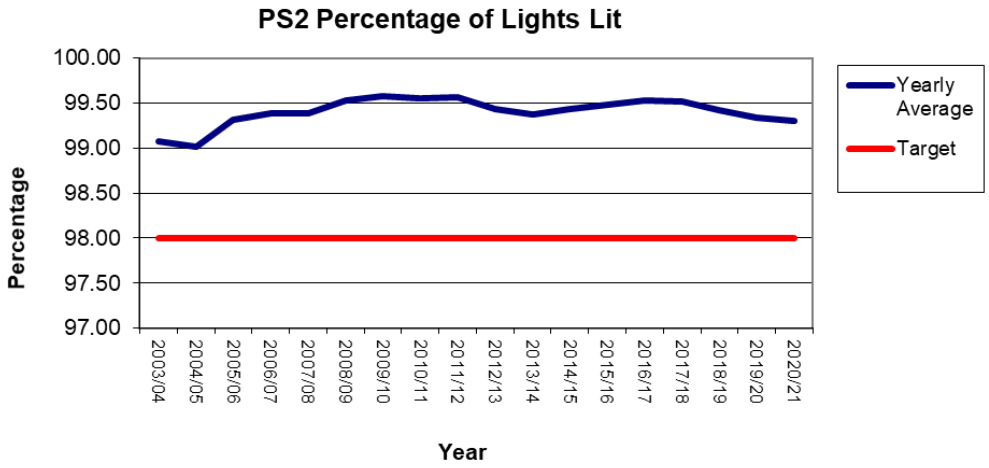
A summary of the data is also accessible by all members of the public and any other interested parties via our dedicated website. The website also includes an overview of our contract activities, answers to Frequently Asked Questions and links to Staffordshire County Council and E.ON websites.

4.3 Maintenance Progress Update

We believe that well planned, well managed and suitably invested cyclic maintenance regimes are the most important part of the project. Our dedicated teams ensure that all streetlights, illuminated signs and bollards remain lit and in a good condition – safe and operationally.

This involves a strict programme of lantern cleaning, lamp changes, electrical and structural inspections as well as night patrols and illuminance checks to make sure that each asset continues to perform as designed and required. The project includes a specific performance target to maintain the number of lights that are lit across the County; above a threshold of 98% which, when you consider that we currently maintain over 108,400 units within the County, this is no small achievement.

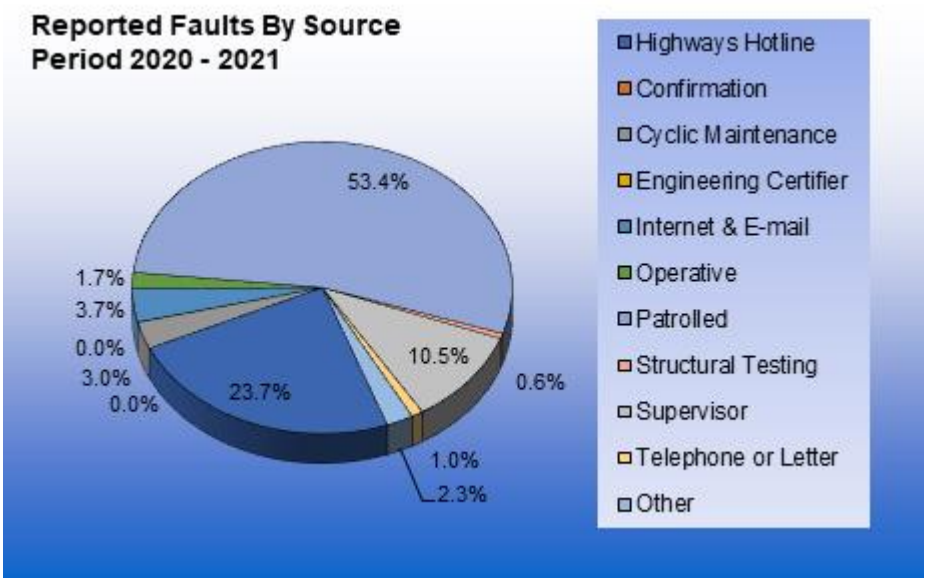
The following chart shows the progress since contract commencement against the target requirements and with an average of 99.4% lights lit since contract commencement, it is an excellent achievement and demonstrates our year-on-year commitments.



Although streetlights are designed to be robust to endure the environmental impacts of day-to-day operation, it is not surprising that faults occur when we factor in the stresses caused by temperature shifts ranging from -20oC to +30oC, driving rain, heavy winds and snowfall. There are several ways that we can be made aware of faults by members of the public – telephone calls and emails directly or via the Staffordshire County Council Highways Hotline. We also undertake night patrols that look at every streetlight and lit sign once a month to check whether they are operating effectively. Our maintenance teams, supervisors, engineers and managers also provide input by reporting issues they find.

Each fault received is recorded within the Asset Management System to ensure the details are recorded to create a detailed history for each individual asset. This provides data that can be reviewed to identify trends, support strategic plans, and assist external agencies, such as the Police when investigation road traffic incidents or other criminal investigations.

The chart below shows the percentage split of the source of fault reports;

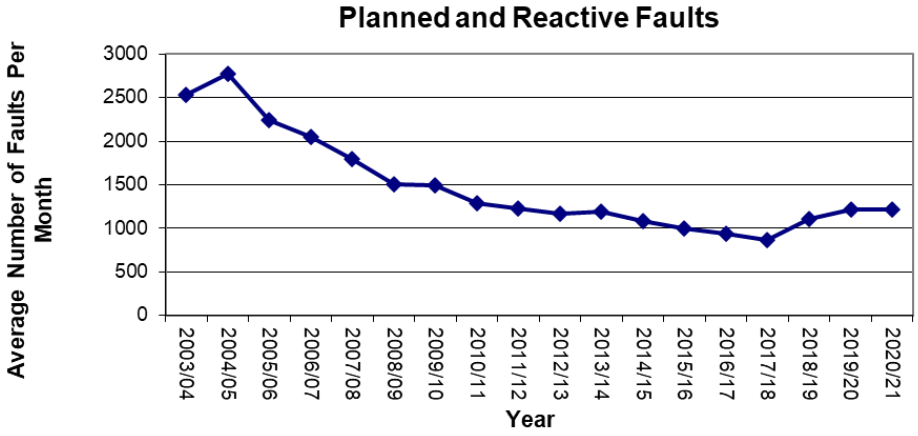


Fault repairs have specific timescales and targets for completion, such as 5 working days to attend and rectify an out of light fault. This timescale commences when we become aware of the issue and financial penalties are applied when the timescales are not met. Of the 320,270 fault reports received since project commencement, we have completed only 0.305% of these outside of the target response time (977).

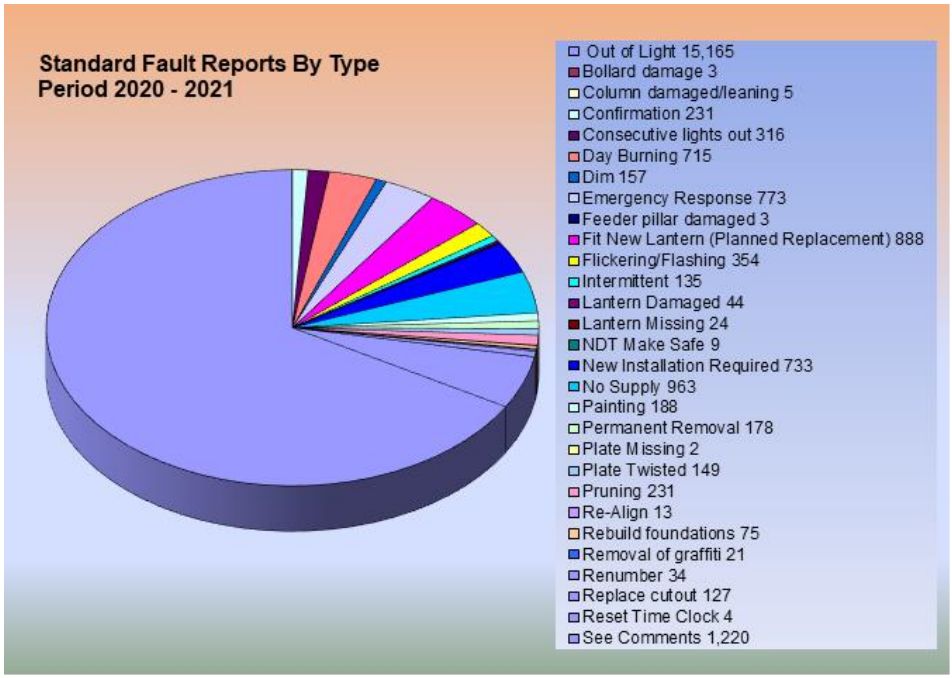
Where streetlights are fed directly from the underground electrical network owned and operated by Western Power Distribution, the Distribution License Holder (DLH) for the region, any necessary power failures caused by cable faults and the like can only be repaired by them. Each regional DLH is regulated by OFGEM for their response and duties to attend all kinds of electrical faults. Whilst this takes a little longer than our normal 5-day response times we continue to monitor attendance times and ensure work is completed quickly and efficiently.

Where we identify equipment that does not meet our standard, we will complete rectification work with the aim of minimising loss of service to the public and preventing a system failure. For the purpose of this report, such work has been excluded from the data to provide a clearer indication of the actual failures rather than internally monitored works.

The following indicates the total number of faults we have attended to each year since project commencement;



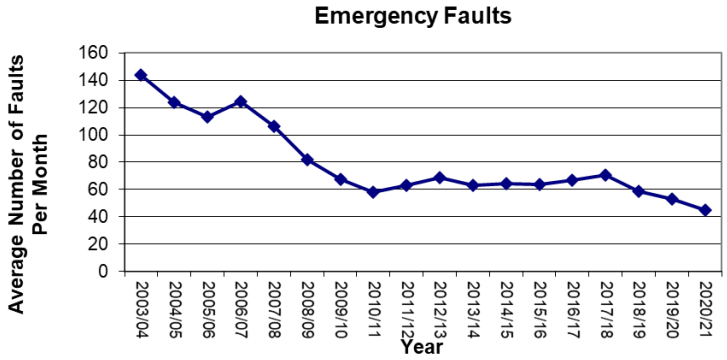
The chart below identifies the type of faults we have attended to over the year, and by maintaining this level of data we are able to spot trends year on year which help us plan future works and strategies;



Emergency events are those that have the potential to cause serious harm or damage to members of the public or property. Our permitted response time to attend and make events of this nature safe is limited to two hours. Our teams are available 24 hours a day, 365 days a year and out of the 537 reported emergency events in this period, all

were attended to within these timescales. Of the 17,233 emergency events that have been reported since project commencement, only 12 were attended to outside the target, 0.069%.

The following chart shows the average number of emergency callouts our teams have attended to each year since the project began, evidencing that well-targeted asset investment has helped to reduce these to almost 30% of the level at contract commencement.



The decorative appearance of the assets can play an important part in making the street scene look clean and attractive.

Most new lampposts carry an industrial appearance due to the galvanised finish, which is applied to help prevent rust and limit environmental damage, but they quickly become part of the landscape.

Any units we identify that fail to meet the strict criteria that surrounds the decorative condition, but are still otherwise serviceable, may be painted to restore a good appearance and provide a protective finish. Painting, except in certain conservation areas where it is purely provided as a decorative finish, is only applied as an aid against the aging process. The paint systems used are selected because of their high durability, anti-graffiti coating, long lasting anti-fade properties, and anti-rusting agents, which help to not only prevent premature ageing but, in some cases, can also help to slow down any rusting that has commenced.

4.4 Invest to Save Programme

During the year we commenced with a four-year contract variation to deliver sustainable energy savings across the county by replacing discharge lamp lanterns with 47,000 LED based lanterns – our Invest to Save programme.

The programme is so called as the replacement of current lanterns with energy saving LED replacements will generate financial savings for the authority and supports the Council climate strategy due to the energy reduction.

As the programme is underway, it won't be long before E-On, the authority and, most importantly, the communities within the project areas start to see the benefits of the lantern replacements.

We have a dedicated team at each of our depot locations and during the period, they have completed 1409 of the 47,000 planned installations, which has already generated an energy saving of 148,435 kWh.

5.0 Customer Service Satisfaction Survey – Summary of Results

Staffordshire is home to almost 875,000 people and covers a geographically diverse area of 1,047 square miles. It is important that we apply a consistent, practical and even approach to all concerns, enquiries and complaints received. Ensuring a balance between the requirements of an individual, the community and any statutory or contractual duties placed upon us can, at times, be difficult and challenging. Every concern is considered on its own merits and where possible we try to put ourselves in the position of the complainant, however there are sometimes concerns that cannot be resolved to everyone's satisfaction.

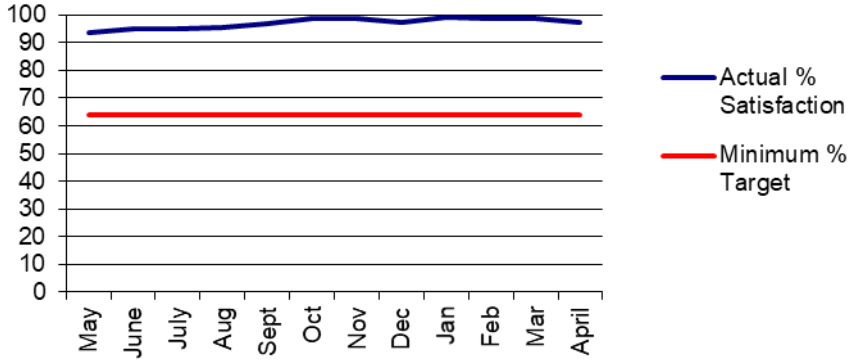
Our customer care process starts at the design stage of any scheme, with consideration being given to the planned locations and positioning of the lampposts. In considering how to proceed we balance the locations required to meet the design with the existing positions, the potential aesthetic impact, and of course the overall safety impact for highway users. Where customer relocation requests do not meet with our priority factors of reducing energy consumption and street clutter, they will not be considered.

We appreciate that the final positioning of some units can be unpopular at an individual level. However, this is often due to alternative solutions carrying high economic and environmental impact, such as the net increase of the number of units in a street – which in turn increases energy and maintenance costs unreasonably. We also look at the benefits to the community and throughout the County when considering our outcome.

The team respond to each concern or complaint raised either in person, by telephone, letter or e-mail. In some cases where an agreement cannot initially be reached, Staffordshire County Council mediate by reviewing the concern and recommendations proposed before deciding upon a solution.

We monitor satisfaction with maintenance activities carried out by contacting individuals who have reported a fault in the month and complete a telephone survey, consisting of a series of questions regarding how easy it was to make contact with us, how easy it was to report the fault and how quickly we completed the repair.

The chart below indicates the level of customer satisfaction throughout the year against the baseline target.



By working closely with Local Authorities, Parish Councils and law enforcement agencies as part of our planning and day to day activities we aim to deliver an acceptable scheme. In Conservation areas and Areas of Special Interest the level of consultation and agreement via the local Conservation Officers and Local Authorities enables us to secure approval and, where necessary, additional funding to enhance the aesthetics of a new lighting system.

Our website, www.lightingforstaffordshire.net, contains links to report faulty lights, documents our Customer Care Charter and Customer Concerns procedure, Frequently Asked Questions, and an updated list of roads to be included within asset renewal programme.

6.0 Crime and Safety Improvement Plan

Staffordshire has one of the safest county council road networks in the country[1] but Staffordshire County Council welcome and encourage feedback from communities in relation to matters surrounding road safety.

All road safety considerations across the county are supported through the collation of objectively measured data which is used to design appropriate solutions. This data might include traffic speeds, traffic volumes and road traffic collision data involving personal injury - where this has been reported to the police.

The new streetlights delivered since project commencement combine with other primary highway strategies and initiatives to help provide a safer network and environment for residents, pedestrians and drivers as well as a deterrent for criminal activity. Studies continue to maintain that well-lit streets lead to a reduction in the fear of crime as communities are more inclined to venture out after the hours of darkness; and the resultant increase and confidence in people traffic can deter criminals from their activities.

Data concerning the number of road traffic incidents resulting in personal injury within Staffordshire, excluding the city of Stoke on Trent, was unavailable for this report.

([1] Road safety issues - Staffordshire County Council)

7.0 Annual Environmental Plan

7.1 Project Aims and Progress

E.ON strives to be a successful company acting with social responsibility and in harmony with natural resources and global climate. Only with a consistent focus on running our business responsibly and sustainably can we help secure our future and create added value for all – our customers, employees, shareholders, business partners and the environment.

We work continually to minimize our impact on the climate and environment, to comply with laws and our own policies, and to respect human rights. We also want to partner with our employees, customers, and other stakeholders to create value.

Within the street lighting industry our focus is to ensure that our environmental impact is reduced so far as practicable in terms of the waste that we produce, how we dispose of our waste, our carbon footprint from the energy consumed, and the way that we procure and use new materials and products.

7.2 Waste Management

Naturally, removing and replacing faulty or life expired parts creates waste, from lamps and lanterns right through to the soil we dig up to access the underground electrical cable network.

It is a requirement for all waste electrical products to be treated in accordance with the WEEE (Waste Electrical and Electronic Equipment) directives. All waste lamps, of which some may contain potentially environmentally harmful chemicals, gases and coatings, are segregated and collected by specialist carriers and treated to ensure that the chemicals are neutralised, and the glass components are separated from the metal elements for onward recycling and reuse.

Where possible, we reuse good quality lanterns from defective units to be able to maintain some of the more traditional stock throughout the County, which reduces our waste impact at source.

Careful selection and management of our waste contract partners ensures that we do as much as we can to reduce our environmental impact. As part of our initial waste management, we provide separate skips for different waste types such as metal, concrete, WEEE, tarmac and spoil. This means we can reduce follow-up costs by ensuring that secondary segregation at waste transfer stations is minimal and contamination is reduced.

The increased usage of LED technology will not necessarily improve our recycling statistics, over 99% would be hard to beat, but the move away from traditional lamp sources will reduce the types of waste and improve the overall environmental impact with chemical waste being removed from the manufacturing and recycling of the product.

7.3 Energy Consumption

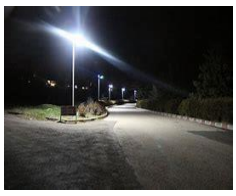
Since the contract commenced in 2003 the unit cost of energy has soared, which has placed significant strain upon households and businesses alike, including the provisions of public services such as street lighting.

Day to day, almost everything we do relies in some part on energy consumption and due to cost increases, we have all had to rethink our personal strategies to reduce energy.

Social responsibility comes at a cost but the interventions and investments ultimately reduce loss and waste at the consumption end of the chain, which will ultimately save cost and increase efficiency in the long run.

Energy reduction has always been a driver for the contract operationally. However, the significant increases in energy costs have forced us, and the industry, to rethink our approach to creating, delivering and maintaining sustainable, low energy street lighting solutions. Like the phasing out of domestic tungsten filament lamps, our early intervention to remove mercury tungsten lamps netted initial savings of over 500,000 kWh per year and the asset renewal programme has continued to steadily reduce energy costs through the careful design and lantern selection processes adopted.

Since 2012 we have measured the direct impact of asset renewal and the implementation of the dimming strategy and this has a cumulative effect of providing annual energy savings of over 2,859,256 kWh.



In September 2015 we completed a significant two-year investment programme to retrofit dimmable control gear into existing higher wattage lanterns. The investment package saw sustainable annual savings of over 3.8 million kWh which equates in today's rates to almost £500,000.

Over the course of the last 17 years we have, through the ongoing commitment and determination of those involved in the project, delivered savings in energy that mean we now have an energy consumption significantly less than when we started even though there are now just over almost 9,000 more assets on the network due to new housing developments, new roads and other investments in the road network than there were in 2003.

7.4 Light Pollution

Light pollution has and always will remain a challenging perception as it will never be possible to completely stop concerns, but there has been a reduction in pollution levels over time.

Upward light spillage, or the city glow effect, has been significantly been reduced as new lanterns have an upwards light ration of less than 1% compared to 35% for ones being removed, which in turn means that there is more light focussed on the highway.

8.0 Annual Innovation Plan

8.1 Project Progress

As previously mentioned, innovation and technological advancement has been significant during the last few years. The industry has been revolutionised by LED solutions, stand-alone dimmable controls and a range of other measures that reduce energy consumption and increase light output. Whilst the momentum of change is set to continue, we have maintained our focus on ensuring products we have invested in are protected rather than being pushed aside by other new developments.

8.2 Contract Modernisation

In 2012 we completed the Contract Modernisation Review which looked at the key delivery outputs of the services required under the contract. In doing this we could address some elements of the output requirements to rationalise maintenance regimes and realise savings. The following summarises the ongoing benefits we have seen from this process.

8.2.1 Contract Modernisation – Maintenance

Maintenance activities have been addressed to make significant savings by changing basic cyclic attendances. We have realigned dates for all maintenance activities to ensure that we complete these in one visit therefore improving efficiency and reducing vehicle costs associated with multiple visits. We also reduced the number of night patrols and bollard washes to align winter and summer regimes.

8.2.2 Contract Modernisation – Asset Renewal

To embrace the emerging technological advancements and energy saving devices, a full review of design parameters and requirements was undertaken to ensure we continue to be efficient and relevant in meeting the lighting requirements and objectives for Staffordshire.

The commencement of the LED replacement programme will provide savings in line with planned forecasts, which will be carefully monitored as we progress, and we anticipate further improvements and enhancements over the coming years.

8.3 Future Plans

Following the feasibility study and assessment works for the Invest to Save programme, we will continue to work in partnership with Staffordshire County Council to facilitate the delivery of additional LED lantern replacement works across the county in order to continue to contribute to the energy saving and carbon reduction goals of the authority.

9.0 Summary

The 2020/21 period has seen the project deliver a good quality, efficient, cost effective and robust service during a global pandemic that saw us enter two periods of nationwide lockdown. Throughout all of this, the contract continued to attend to faults on street lighting furniture to maintain the highway lighting.

We have continued to deliver energy savings to the Authority, most notably through the commencement of the Invest to Save programme but also taking into account combined maintenance regime changes.

For this period, the asset renewal and maintenance operations are on or ahead of target having replaced over 2,000 units taking us to over 51,000 assets replaced since project commencement and lights lit have been consistently above the target of 98% with an annual average of 99.31%.We have attended to over 14,500 routine fault reports, over 500 emergency events, carried out routine maintenance checks and continued with night patrols.

If you would like to find out more about the Staffordshire PFI Project or E.ON UK, please visit our websites atwww.eonenergy.com/business/networks-and-infrastructure/street-lighting.html or www.lightingforstaffordshire.net or write to us at:

E.ON Energy Solutions Limited
Units 8 -10 Sandown Industrial Park
Gosforth Road
Derby
DE24 8HU

If you would like to report a street lighting fault please visit the Lighting for Staffordshire or Staffordshire County Council website, telephone the Highways Hotline on 0300 111 8000 or e-mail the details to highways@staffordshire.gov.uk.