

**Climate Emergency Policy and Scrutiny
Committee**

28 February 2023

Report of the Director of Transport, Environment and Planning
Portfolio of the Executive Member for Environment and Climate Change

LED Lighting Update Solar Lighting

Summary

1. The Council has converted 60% of its 21500 lamp columns to Light Emitting Diode. LED reduces power usage by approximately half. All new lights are changes to LED where ever possible. Solar technology is progressing and is therefore kept under review. This report constitutes a formal review.
2. City of York Council has installed solar lighting in amenity areas such as Hull Road Park and at Bus Stops. This amenity lighting has worked well.
3. In response the Council has commissioned work to review the technology of solar lighting and its suitability for street lighting.
4. Unlike amenity lighting the Council has a street lighting policy that sets out the way street lighting should be designed and managed.
5. This report details an ongoing piece of work to review the technology of solar lighting and its suitability to meet the current design standards for highways and considers where it may be possible to deploy further solar lighting.
6. The technology is developing and progressing all the time and it is recognised that this report will need to be reviewed as new products come to the market.

Recommendations

7. The Economy and Place Scrutiny Committee is asked to:

- Note the ongoing work to assess the suitability of solar lighting for street lighting.
- Consider any recommendations for a change in the Street Lighting Policy

8. Reasons:

- Paper requested by Economy and Place Scrutiny Committee.

Background

Existing Asset Profile and Investment

9. The Council is responsible for approximately 21,500 lighting columns. These are a mixture of concrete and steel columns.
10. An ongoing investment programme has replaced the columns which are structurally impaired and at risk of failure. Approximately 270 columns are replaced each year. Whenever a column is replaced, new lanterns are fitted to the new column. There are approximately two to three years left to complete this programme.
11. The lanterns on City of York Council columns are made up of the following technology
 - Low Pressure Sodium – a monochromatic orange coloured light source that gives a good efficacy (light output in lumens per watt) but has very poor colour rendering (measured in Ra as 0) making even orange coloured items appear different. It also has poor glare characteristics and is very hard to control with the majority of light going straight up or backwards. It has a low life expectancy for the lamp (bulb).
 - High Pressure Sodium – a peach coloured light of medium efficacy and a reasonable colour rendering (Ra of 25). It has been popular from the 1980's until recently as it gave good all round performance with a choice of good optical control. The life expectancy of this is good with five years between lamp changes now being experienced.
 - Fluorescent – a white coloured source with high colour rendering (above Ra 60) but good efficacy and a low lamp life (as experienced by the Council). It is more commonly used for signage and bollards and has been used to replace mercury fittings in the city.

- Metal Halide (including Cosmo) – a white light source of high colour rendering and efficacy with a good lamp life. Similarly to high pressure sodium it has been popular in areas where good lighting and colour recognition is required i.e. CCTV and central areas.
 - LED's- These currently offer the best rendering with the longest life and good efficacy. Being a more directional point type of lighting source it also offers good control.
12. All new schemes use LED lanterns. The Council has also invested and converted approximately 60% of street lights to LED technology.
 13. Conversion to LED reduces the energy consumption by approximately half depending on the original lamp with the accompanying environmental benefits.
 14. The reduction of energy usage results in a financial saving as we work with Northern Power Grid to establish the usage of our unmetered street lighting assets.
 15. The charge per unit is outside the Council's control and can be flexed by the energy suppliers in response to the markets and the way the street lighting assets are managed by local authorities.

Lighting Design Duties, Powers and Standards

16. There are currently no statutory obligations or requirements for a local authority to provide street lighting, instead the following statutes enable them to provide public lighting.
 - The Highways Act 1980 empowers a local Highway Authority to provide lighting where they are or will be the Highway Authority (existing roads or new developments). District and Parish Councils have devolved powers as local lighting Authorities conferred under The Public Health Act 1985 and The Parish Councils Act 1957 (however consent must be given from the Highway Authority).
 - With these powers the Highway Authority has a duty of care to the users. Any loss or injury to an individual due to the inappropriate use of these powers may result in action being taken to recover the losses claimed. Action can be taken on several grounds including – negligent exercise of power; action for misfeasance of public office; breach of common law duty of care (if it can be established). NOTE: This duty of care does not imply a duty on the Highway Authority to keep the public lighting lit. Instead it implies a duty to ensure systems and processes are in place to maintain and keep the

lighting in a safe condition i.e. the detection of dangers electrical or structural.

- The Health and Safety at Work Act 1974, the Management of Health and Safety at Work Regulations 1992 and the Construction (Design and Management) Regulations 2007 set out the arrangements and requirements for works to be carried out in a safe manner, along with establishing arrangements for managing construction works.
- The New Roads and Street Works Act 1991 enables the duties of Street Authorities to coordinate and regulate works in the highway. All underground cables therefore should be recorded in accordance with this Act along with the requirements of the Electrical Safety, Quality and Continuity Regulations 2002.
- Other frameworks of legislation that do not specifically relate to highways or public lighting functions (not exhaustive) but deal with issues of the services involved and their provision are – the Equality Act 2010, the Criminal Justice and Public Order Act 1994, Annex A of the Human Rights Act 1998, the Freedom of Information Act 2000 and the Local Government Act 2000.

Design Standards and Considerations

17. In addition to and including the legal powers and duties to enable City of York Council to have a high quality and consistent approach to lighting, the following considerations are considered as part of developing a lighting design for each location:
- the primary user of the highway;
 - any special requirements for vulnerable users i.e. pedestrians, cyclists, heavy traffic;
 - the location and environmental classification / zone of the highway;
 - the usage of the highway / area i.e. car park, square, architectural;
 - the location of local amenities e.g. schools, public buildings, shops;
 - daytime and night time visual appearance of equipment;
 - obtrusive light and pollution;
 - energy efficiency - whole cycle carbon emissions and costs;
 - equipment reliability (some lighting types need very little maintenance e.g. LED's);
 - equipment locations in relation to obstructions and maintenance;
 - whole life costs;
 - strategies relating to whole streetscape i.e. Conservation approach "historic core";
 - end of life equipment disposal i.e. recyclability;

- public risk from accident i.e. passively safe columns, pedestrian crossings and conflict areas.

18. The Council's street lighting policy requires that all new schemes, conversions and upgrades are designed to BS5489 2013 Code of Practice for the Design of Road Lighting and BS EN 13201 2003 Road Lighting.
19. BS5489 2013 - recommendations are given for general principles of road lighting including aesthetic, technical aspects, operation and maintenance. BS5489 2013 considers the design of lighting for all types of highways, public thoroughfares and pedestrian and cyclists subways and bridges. It also covers the design of lighting for urban centres and public amenity areas, aerodromes, railways, coastal waters, harbours and navigable waterways. It provides tables of lighting levels that authorities should consider for different locations and situations.
20. BS EN 13201 2015 – this is a design standard on the selection of lighting in different locations, performance requirements, calculation of performance and methods of measuring lighting performance and energy performance indicators

21. Options for Solar

22. Solar lighting has proved successful as amenity lighting, such as at Hull Road Park and around bus stops. However, these locations have different requirements to street lighting. For instance, the LED lanterns on the Solar columns in Hull Road Park dim to 10% after the latest park closing time and then the levels come back up on motion sensors, which are rarely triggered as the park is locked most of the evening. These have been successful.
23. However, when considering using solar lighting for street lighting on the adopted highway, the ability of the technology to meet the Council's standards needs to be considered.
24. The Council have commissioned a report from WSP (see Annex A). A second report has been commissioned to evaluate Hull Road Park lighting and its suitability for the adopted highway.
25. The WSP report considers that solar lighting is currently only suitable for footway (with no carriageway) and park lighting. In these types of installations there needs to be a control system that dims the lighting

when people are not about and then brings it back up in sections when people wish to use the path.

26. The conclusion is that, from an economic business case, solar is not cost effective where a cable supply is currently present. Where a cable supply is not currently present solar maybe the most economic option, but noting that lighting levels and current adopted policy may not be met.
27. The WSP report recognises that alternative power solutions are rapidly evolving, and it is highly probable that future product designs and research will make the solutions discussed viable in UK within the next few years.

Current Policy

28. The Councils current street lighting policy states that where a bollard (keep left/right, no-entry) is required to be lit the authority replaces it with a solar powered unit. This cuts the energy requirements to zero and reduces safety implications from mains electric. But does talk about ongoing trials.

Next Steps

29. Solar technology as it stands cannot illuminate to the Council's Street Lighting Policy and the stated levels the Council illuminates to on our Adopted Highways and in line with BS 5489.
30. Officers are preparing expressions of interest to obtain further funding for the conversion of the remaining street lighting which has not been converted to LED as the business case remains challenging.
31. There are areas which can benefit from solar and officers will continue to use solar for parks and footways. Following trials the Council will specify solar for illuminated traffic signs, bellisa beacons and school flashing units where appropriate.
32. Whilst the technology is not yet suitable for solar as street lighting to meet the current policy, officers are also developing a small proposal for a trial of solar street lighting. This would require the council to depart from standards around adopted lighting levels but may be suitable for a quiet residential street. It would therefore require resident engagement on the proposals before a decision is made.

Consultation

33. As detailed above, any lighting which is a departure from standard and will result in changed lighting levels should be done in consultation with the immediate residents.

Council Plan

34. Getting around sustainably

The provision of public charging supports the adoption of plug-in vehicles.

35. A greener and cleaner city

The provision of public charging supports the adoption of plug-in vehicles which support these objectives. Whilst noting that private vehicles are at the bottom of the travel hierarchy, the York Public EV Charging Strategy has been developed to respect wider transport objectives and avoid counter productive measures.

Implications

36. **Financial**

There are no financial implications any decisions would require a business case and financial considerations.

37. **Equalities**

The Council needs to take into account the Public Sector Equality Duty under Section 149 of the Equality Act 2010 (to have due regard to the need to eliminate discrimination, harassment, victimisation and any other prohibited conduct; advance equality of opportunity between persons who share a relevant protected characteristic and persons who do not share it and foster good relations between persons who share a relevant protected characteristic and persons who do not share it in the exercise of a public authority's functions).

Equalities Impact Assessments will be carried out as and when appropriate.

38. Legal

The legal powers and duties have been set out in the body of the report.

Contact Details

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Report **Date** 20/01/2023
Approved

Wards Affected: List wards or tick box to indicate all **All**

For further information please contact the author of the report

Background Papers:

**Street Lighting Policy adoption 15/11/2018 Executive Member for
Transport**

<https://democracy.york.gov.uk/ieDecisionDetails.aspx?ID=5358>

Annexes

Annex A Solar PV Assessment by WSP