



CABINET – 30TH MARCH 2015

SUBJECT: STREET LIGHTING ENERGY SAVING PROPOSALS 2016-17

REPORT BY: CORPORATE DIRECTOR - COMMUNITIES

1. PURPOSE OF REPORT

- 1.1 This report explains the stages required to attain the projected Street Lighting Energy Savings (EN5) agreed at Cabinet (February 2015) as part of Medium Term Financial Plan (MTFP) 2015-16 & 2016-17. The recommendation is for Cabinet members to note the progress made so far and to consider options for finding the savings from street lighting proposal 2016-17.

2. SUMMARY

- 2.1 Caerphilly County Borough Council (CCBC) has a current lighting stock of approximately 27,500 units, which have been subject to a number of energy saving measures (inter-urban part-night lighting, replacement of conventional bulbs with low-energy alternatives, dimming etc.).
- 2.2 The MTFP 2015-16 EN5 saving looks for an energy saving of £450k over 2015-16, 2016-17 with the combination of an investment of £980k in LED replacement technology and the equipment required to part-night light enough urban lighting units to achieve all of this saving.
- 2.3 The LED technology element of this investment is currently being installed with between 8-9,000 lighting units converted to lower energy ratings by the planned end date of March 2016, realising £100k (in 2015-16) of the total £450k saving.
- 2.4 The target saving for the Part-night lighting element of the MTFP 2015-16 EN5 (£450k) is £160k, this proposal has undergone an assessment process summarised in Section 5.3 of this report and detailed in Appendix B. The outcome being that it is achievable, but may have implementation issues as most are situated in urban areas.
- 2.5 An alternative option to the £160k part-night lighting saving is to reduce the Lighting Maintenance budget by this amount in 2016-17.

3. LINKS TO STRATEGY

- 3.1 The report links directly to the Council's priority to ensure that communities are safe, green and clean places to live and to improve residents' quality of life by reviewing, renewing and installing lighting energy saving technologies.
- 3.2 This proposal has a contribution to make in improving sustainability with more effective lighting and the reduction in energy usage for these lighting replacements. As noted in the Single Integrated Plan - A **Greener Caerphilly** which aims to: improve local environmental quality (G01) and reduce the causes of and adapt to the effects of climate change (G02).

4. BACKGROUND TO THIS REPORT

4.1 Background to Street Lighting

4.1.1 No statutory requirement on local authorities in the United Kingdom exists to provide public lighting, the Highways Act 1980 (Sections 97 & 98 - summarised in Appendix A), empowers local authorities to light roads (Highway Authorities may provide lighting for the purposes of any Highway or proposed Highway for which they are or will be the Highway Authority), it does not place a duty to do so. Although Highway Authorities do have a duty of care to the road user, and an obligation to light obstructions on the highway, this does not imply a duty on the Highway Authority to keep all lighting operational. The Council has a statutory duty under the Highways Act to ensure the safe passage of the highway (as far as reasonably practicable) and this includes any lighting equipment placed on the highway.

4.1.2 The profile of street lighting has changed in recent years, with trial areas for low-energy lanterns and part-night lighting regimes taking place from 2010 onwards. As a quick energy cost comparison:

Financial Year	Number of Lighting Units	Annual Energy (KWh)	Annual Cost	Average Energy Usage per unit (Cost)
2008-09	26,872	13,866,208	£1,336,270	516kWh (£50)
2011-12	27,053	13,287,567	£1,390,438	491kWh (£51)
2014-15	27,522	13,375,432	£1,541,478	486 kWh (£56)

Table 1: CCBC lighting energy usage and costs from 2008 to 2015

The stock can be seen to increase 2.5% (650 units) over the 6 years (mainly due to new developments), giving an average of 0.4% increase per annum, increasing the energy demand and Council liability. Despite this stock increase, the decrease in the average energy usage (per unit) can clearly be seen. The rise in cost (per unit) is mainly due to the increasing cost of energy; this would have been much higher if energy saving measures (inter-urban part-night lighting, dimming etc.) had not taken place.

4.1.3 To date a number of measures have taken place to reduce energy consumption in CCBC.

4.1.4 In 2009-10 CCBC implemented part-night lighting (switched off between mid-night and 5.30 am GMT – as agreed by the Council in 2009 for implementation in 2010 onwards) for the majority of the inter-urban roads (between towns and villages); approximately 5,000 units in total.

4.1.5 In 2012-14 areas were nominated for low energy lighting (CPO Halide), trialled in selected areas around the county borough; approximately 2,000 units in total.

4.1.6 In 2012-14, Central Management System (CMS)/ Dimming schemes were installed in trial areas, with its installation into approximately 3,000 units in total. This works by dimming the lights (via the CMS) by around 20% from 9pm (CPO Halide units) and from midnight (SON units) to 5am to realise energy savings. This is achieved by reducing the power to the light source, i.e. a 10% reduction in lamp wattage, not a 10% reduction in light output. The threshold for this reduction is 50%, a visible difference being perceived by the naked eye after this point; this being the case, increasing the dimming will have a limited effect. Better efficient energy savings can be attained through more recent and effective ranges of lighting technologies, such as LED replacements.

4.1.7 There are also ancillary apparatus that include lit signs and bollards. These are of marginal cost to the annual energy budget, amounting up to £10k each; with traffic lights having a figure of £50k per annum. Though these are not seen as a priority (as more significant savings can be realised with street lighting replacements), the older/ life expired ancillary units are gradually being replaced by modern energy efficient LED versions, as finances allow.

- 4.1.8 In 2015-16 a capital investment of £980k was made for replacement of approximately 8,000 compatible lighting elements with LED gear trays. These are now being installed with a projected completion date of March 2016.
- 4.1.9 The current lighting budget for 2015-16 is £2,028k of which £1,398k is on energy; leaving £630k for all the Routine and Non-routine Maintenance. Therefore, any savings in energy will have the largest impact on the energy bill for street lighting.
- 4.1.10 Part of the Asset Management function of Highways Operations includes a maintenance role for all highway assets. Since the existing street lighting assets have been installed by the Council; they are recorded, monitored and maintained with a dedicated Street Lighting Maintenance Budget.
- 4.1.11 An energy saving was agreed in the Medium Term Financial Plan 2015-16, EN5 - Street Lighting Energy Reduction measure, agreed at Cabinet in February 2015. In summary this proposed that:

'A combination of options will generate £450k saving in full year, including energy reduction initiatives and some part-night lighting in residential areas. An upfront investment of £980k will be required. Present indications are that £290k can be achieved via new technologies with £160k achieved via part-night lighting.'

The £980k refers to the LED gear-tray replacements (reference 2.3), the £290k refers to the projected annual energy savings from this investment and the £160k refers to the expected savings from a Part-night lighting exercise, which is outlined in Section 5.3.

5. STREET LIGHTING SAVING OPTIONS

5.1 Energy Costs and Switch-off Option

- 5.1.1 Energy costs are calculated by the energy provider using the updated asset register (provided on a monthly basis by CCBC Highways Operations) and the photo-cell array (currently sited on the Civic Centre) as references. The register will give the quantum and type of lighting assets CCBC currently hold and the array will give the estimated burn hours per night.
- 5.1.2 A variant in energy savings are that they subject to the market rates (11.2665 Pence/ kWh unit, as of August 2015), presently lower than the MTFP proposed rate, set October 2014 (11.5247 Pence/ kWh unit), so in 2014 the cost of 1,000,000kWh was £115,247, in 2015 it was £112,665.

Market fluctuations will therefore have a bearing on the revenue savings level attributed to the LED/ CPO Halide replacement units, i.e. lower energy prices giving lower energy cost savings, even though the cost of energising the asset (from conventional Low/ High Pressure Sodium to LED/ CPO Halide) will still be lower.

- 5.1.3 The future energy prices are unlikely to stay at their current low levels, so any reduction in energy usage made now will probably appreciate as the energy costs rise, giving the Council a method of future cost avoidance. Future investments proposals will be referenced in a further report.
- 5.1.4 The vagaries of energy pricing to one side, in achieving the remaining saving of £160k, various options will need to be reviewed and may be required to attain the £450k overall target.
- 5.1.5 The switch off option is always open to the authority for an absolute energy saving, but has its own costs, due to the fact that disconnected lighting apparatus rapidly deteriorate and will need to be removed for safety. This can happen within 12 months of switching off. Due to the disproportionate cost of removal and possible replacement, this particular option has been

discounted from this report; nevertheless as future financial climate dictates, this may have to be revisited.

5.2 Energy Savings Status

5.2.1 The LED gear-tray replacements will bring an annual saving of ©£290k to CBCC's energy bill as outlined in the MTFP Plan 2015-16, EN5, referenced in 2.2. This was to be split between a predicted £100k in 2015-16 with an additional £190k saving in 2016-17.

5.2.2 LED gear-tray replacement installation started in August 2015 with a planned completion by the close of March 2016.

5.2.3 To date the energy figures from this year (2015-16) can be compared to last year's are as follows:

April to January – shows a saving of **£54,000**

February and March – has a projected saving of **£43,000**

Annual projected saving of **£97,000** for 2015/16 – Just below the £100k target, due to the fall in energy prices (ref. 5.1.2).

This shows that the target savings of £100k can eventually be realised by March 2015, which means that the annual energy saving of £290k (an additional £190k to this 100k) is achievable in 2016-17.

5.2.4 The remaining energy saving required for 2016-17 is £160k and was initially thought to be achieved through Part-night Lighting.

5.3 Part-night Lighting Assessment in Urban Areas

5.3.1 The existing street lighting stock in CCBC has already been subject to a Part-night lighting exercise with the majority of the inter-urban routes now being switched to part night lighting. In combination with this, there are trial areas for low energy lighting (installed 2012-14 in selected areas around the county borough to assess the effectiveness of energy savings) and the replacement of existing residential (high energy use) sodium bulb units with LED gear trays (installation 2015-16). All of the above have been excluded from consideration in this Part-night lighting review.

5.3.2 The remaining eligible stock for street lighting (i.e. not subject to LED/ CPO Metal Halide replacement or part-night lighting regime) numbers around 7,500 units and are located primarily in the Council's urban areas. These form the basis for the assessment process, which is detailed in Appendix B.

5.3.3 The steps taken in this assessment further eliminate 'conflicted areas' (containing junctions, roundabouts, traffic calming etc.), as these lighting units cannot, for safety concerns, be part-night lit.

5.3.4 As can be seen from this process (detailed in Appendix B) the savings of £160k can be realised from part-night lighting all the urban lighting outside 'conflicted' areas, though there may be issues with public appeals and subsequent local re-assessment exercises which would need to be instigated by CCBC before this proposal was enacted (a model of which is outlined in background paper Torfaen Cabinet Item 8 – Street Lighting – Our Strategy for the Future – July 2011). There are alternates to this approach, as outlined in Section 5.4.

5.3.5 Part Night Lighting is estimated to cost £160k, to install the required hard-ware for all the lighting units outside the 'conflicted zones', the cost of which can be recovered (through the energy savings outlined in 5.3.4) within 12 months.

- 5.3.6 A possible part-night lighting objection from the public could be about the detrimental effect on safety; this seems to be more of a perception rather than a reality. A recent study, led by the London School of Hygiene & Tropical Medicine in partnership with University College London (published in the Journal of Epidemiology and Community Health - July 2015) showing no increase in crime rate (from 2010 to 2013) or decrease in road safety (from 2000 to 2013) in locations where a part night lighting regime had been in place. (Briefing note for this in Appendix D). These findings can be further supported from the experience of Street Lighting Strategy in Torfaen (reference to Torfaen Cabinet Item 8 – Street Lighting – Our Strategy for the Future – July 2011).
- 5.3.7 There is also an expectation of residents' dissatisfaction due to service divergence, with neighbouring streets having either LED replacement units that will give all night illumination, next to conventional street lighting (incompatible with LED gear-tray replacements) that is lit only to midnight (under a part-night lighting regime). There would be examples that fall between these two situations, with the possibility of part-night lighting and LED replacements in the same street.

5.4 Savings Alternatives to Part Night Lighting in Urban Areas

- 5.4.1 The switch off option is always an alternative, though this has its own significant costs and consequences (ref. 5.1.5).
- 5.4.2 Another savings alternative is to reduce the street lighting maintenance budget, currently totalling approximately £630,000. This is split into Routine Maintenance (replacement of lighting elements) approximately £275k and Non-routine Maintenance (replacing/ repairing other components such as the column, lantern, cabling etc.) approximately £355k.
- 5.4.3 The current street lighting stock amounts to approximately 27,500 units, with approximately 8,000 LED gear-tray conversions being in place by April 2016. The design life of conventional lamps is around 4-6 years. This compares to around 10 to 15 years for the LED alternates and LED gear-trays replacements. Consequently this means that approximately a third of the stock is estimated to have a design life over double that of conventional lamps. With this being the case the Routine Maintenance budget could be reduced by a third giving, a saving of £100k.
- 5.4.4 Any reduction in the Lighting Maintenance budget will have an effect on the service quality and responsiveness, with the possibility of broken/unserviceable lights remaining broken /unlit for longer durations than is currently the case.
- 5.4.5 The proposed decrease in budget (£160k out of £630k) will result in a reduction in service leading to a relaxation of response times of approximately 20%, so increasing turn-around times from the existing 3 to 9 days to a response time of 5 to 12 days. This will have an effect on our performance as an Authority, for example the most recent nation-wide APSE (Association of Public Service Excellence) survey of 2013-14 scores Caerphilly with a 95% rate for restoration for working lights within 7 days of reporting (ranked 6th out of 20 peer Councils) – our average response/ repair times being 4 days. With this relaxation a fall to a 5-6 day average would see this position fall to 12-15th place. This is with the proviso that peer councils are not seeking to reduce their own service quality level, if they do make reductions then the position may not be as great.
- 5.4.6 At Scrutiny Committee Meeting on the 8th December 2015, it was recommended that the proposals to achieve £160k MTFP savings, through a reduction in the lighting maintenance budget, was supported and that the part-night lighting be a consideration in future MTFP savings measures.

5.5 Summary of Savings Options

- 5.5.1 There are four main options to realise the 160k energy saving for 2016-17:

- A. Switch off all non-conflict area lights
- B. Part-night Light all the lighting units in non-conflict areas
- C. Part-night Light a proportion of lighting units in non-conflict areas, and then make up the difference from the Lighting Maintenance Budget
- D. Secure the £160k from the Lighting Maintenance Budget
- E. Combine the savings from the reduced Lighting Maintenance Budget and Part-night Lighting of non-conflicted areas

5.5.2 Considering the sensitivity of the residential areas concerned and the lack of time to fully implement part-night lighting for all non-conflicted zones and, in line with Scrutiny recommendations, it is recommended that Option D is selected as savings for 2016-17.

6. EQUALITIES IMPLICATIONS

6.1 The longer repair times for street lights could have a significantly greater negative impact on people with certain types of visual impairment compared with the majority of the population, although the delays are to be kept to a minimum wherever possible. It will also significantly affect older people for both reasons of eyesight and feelings of vulnerability.

7. FINANCIAL IMPLICATIONS

7.1 There will be a reduction in street lighting energy and street lighting maintenance expenditure and a reduction in budget provision to assist with the Council's Medium Term Financial Plan (MTFP).

8. PERSONNEL IMPLICATIONS

8.1 These proposals will not have any direct impact on CCBC personnel.

9. CONSULTATIONS

9.1 All comments received have been taken into consideration and are included in the report.

10. RECOMMENDATIONS

It is recommended that:

10.1 The preferred Street Lighting saving, as outlined in Section 5.5, is Option D - sourcing the whole saving from the Lighting Maintenance Budget.

10.2 Part-night lighting be reviewed and considered as an option to form part of a future report to Cabinet on Investment Options for street lighting.

11. REASONS FOR RECOMMENDATIONS

11.1 The reason for recommending Option D for the £160k saving is due to the possible implementation issues (such as formulating and introducing assessments and appeals procedures), with the majority of the nominated part-night lighting units being located within urban areas. This will allow the agreed £160k saving to be made in 2016-17, whilst the part-night lighting process is reviewed in tandem with future investment options.

12. STATUTORY POWER

12.1 Highway Act 1980.

Author: Graham Parry - Highway Operations Group Manager
Consultees: Cllr T Williams – Cabinet Member for Highways, Transportation & Engineering
Chris Burns – Interim Chief Executive
Christina HARRY - Corporate Director – Communities
Nicole Scammell - Acting Director of Corporate Services and S.151
Dave Street - Corporate Director – Social Services
Terry Shaw – Head of Engineering Services
Gail Williams – Interim Head of Legal Services/Monitoring Officer
Stephen Harris – Interim Head of Corporate Finance
Rob Hartshorn – Head of Public Protection
Mike Eedy – Finance Manager
Trish Reardon – HR Manager
David Thomas – Senior Policy Officer (Equalities and Welsh Language)
Steve Hodges – Network Management Manager
Thomas Llewellyn – Senior Assistant Engineer

Background Papers:

Highways Act 1980

London School of Hygiene & Tropical Medicine in partnership with University College London
(published in the Journal of Epidemiology and Community Health - July 2015)

Torfaen Cabinet Item 8 – Street Lighting – Our Strategy for the Future – July 2011

Appendices:

Appendix A – An extract summary of Highways Act 1980 (Sections 97 & 98)

Appendix B – Street Lighting Options Process

Appendix C – APSE Briefing Note 15-43 – Street Lighting Switch-off Outcomes