REGENERATION AND ENVIRONMENT SCRUTINY COMMITTEE – 30TH OCTOBER 2018

SUBJECT: **FUTURE LIGHTING AND ENERGY SAVING PROPOSALS**

REPORT BY: **INTERIM CORPORATE DIRECTOR - COMMUNITIES**

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1. PURPOSE OF REPORT

1.1 To provide members with an update on future lighting and energy saving proposals. Proposals have had to be amended following notification of energy price increases for 2017/18 being significantly higher than anticipated. Updated energy savings proposals are now included within the report for members' consideration and comment prior to reporting to consideration by Cabinet.

2. SUMMARY

2.1 Following the report presented to the Regeneration and Environment Scrutiny Committee on 15th May 2018, the authority was notified of significant unexpected energy price increases for 2018/19. The report had outlined the options available to achieve street lighting energy savings that could contribute to the Medium Term Financial Plan (MTFP) and mitigate energy cost increases and carbon reduction savings.

2.2 The Regeneration and Environment Scrutiny had previously unanimously recommended that Cabinet support their comments below in relation to the report dated 15 May 2018:-

(i) The Phase 1 approach to progress a wholesale conversion of the street lighting stock to LED lanterns be implemented;

(ii) The Phase 2 approach to extend part-night lighting on inter-urban routes to include connecting roads in towns and village not be supported, pending further specifics on the locations that would be affected;

(iii) The Phase 3 approach to part night light the whole of the stock from midnight to 05.30am, with the exclusion of junctions, conflict areas, and major town centres, not be supported.

2.3 Following the presentation of the report, the Authority has now received their electricity supplier invoice for 2018/19, with the unit rate having significantly increased compared to 2017/18 (a total increase of 13.4%) which is greater than the cost originally anticipated. These increased charges will require additional funding of £165,000 from the Communities Directorate Infrastructure budget for which no allowance has been made.

2.4 This updated report outlines revised options available to achieve street lighting energy savings that could contribute to the Medium Term Financial Plan (MTFP). Information is provided on the progress made so far in achieving financial and carbon reduction savings in relation to street lighting and members are requested to again review and provide comments on future

street lighting energy savings options that can be considered prior to presentation to Cabinet.

2.5 Caerphilly County Borough Council (CCBC) has a current lighting stock of approximately 27,300 units some of which have already been subject to a number of energy saving measures:-

- Part night lighting, where 4844 lights are turned off between midnight and 05.30GMT on Inter Urban routes.
- Dimming of 3974 lights by 50% reduction in power from 9pm each night.
- LED bulbs retro fitted to 11521 units (including signs).

2.6 These energy saving measures account for annual savings in excess of £500k and carbon footprint reductions of 1950 tonnes of CO2.

2.7 The report outlines further energy saving options to meet the requirements for the 2018-22 MTFP. These will in turn provide carbon reduction savings that will contribute to the authority's carbon reduction commitment.

2.8 The report also outlines the discontinuation of the manufacture of low pressure sodium (SOX) lanterns and the implications for the authority.

2.9 Due to the continued energy cost increases and the discontinuation with the manufacture of SOX lanterns "do nothing" is not an option that can be considered.

3. LINKS TO STRATEGY

3.1 This report links directly to the Well-being Goals within the Well-being of Future Generations Act (Wales) 2015:

- A prosperous Wales
- A resilient Wales
- A healthier Wales
- A more equal Wales
- A Wales of cohesive communities, and
- A globally responsible Wales

3.2 The street lighting energy savings will contribute to the authority's Well Being Objective 4: Promote a modern, integrated and sustainable transport system that increases opportunity, promotes prosperity and minimises the adverse impacts on the environment.

3.3 There are further links to the Engineering Objectives:

3.3.1 To provide safe and efficient transport and land drainage infrastructure through quality service delivered by means of cost effective management, maintenance and improvement of the networks.

3.3.2 To develop engineering solutions and methods which have regard to the value of the natural and built environment and to the principle of sustainable development.

3.4 The report supports the Safer and Greener themes of the "Caerphilly Delivers" in the Single Integrated Plan.

4. THE REPORT

4.1 Background to Street Lighting

4.1.1 There is no statutory requirement on local authorities in the United Kingdom to provide public

lighting. The Highways Act 1980 (Sections 97 & 98) empowers local authorities to light roads, 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 While the profile of street lighting has changed in recent years, the stock has continually increased at an average of 110 units per annum which in turn reduces the impact of savings made. This increase is predominantly a result of adoption of new development sites.

4.1.3 Part of the Asset Management function of Highways Operations includes a maintenance role for all highway assets. The street lighting assets are recorded, monitored and maintained with a dedicated Street Lighting budget.

4.1.4 The street lighting budget allocation for 2017/18 was £1,704,000, which was inclusive of £1,228,000 energy costs. This has already seen a saving of £350,000 from 2016/17 budget to attain the MTFP target. This reduction in budget consists of £190,000 of energy savings and £160,000 from lighting maintenance.

4.1.5 A number of energy efficiency options have previously been implemented. During 2017/18 energy efficient lamps, dimming and part night lighting alterations achieved a 4.5% decrease in energy usage. The savings realised from these options were reversed due to a 12.4% rise in energy costs in 2017/18 resulting in a £40k increase in energy costs overall. . The 2018/19 energy unit rate rose to 13.6516 pence per kWh, a 13.4% increase over the 2017/18 rate. It appears that the overriding impact in terms of the increase is in relation to the non-energy costs set by government increasing, particularly Renewable Obligation / Contracts for Difference, Feed in Tariff and TNUoS charges. These charges are out of EDF's control, they merely collect the levies and pass them through to the customer. According to the information received, the energy proportion had decreased from 40.28% to 36.14%.This scenario is likely to continue and while the outlined proposals show projected savings, it should be noted the proposals should be viewed as a way of cost avoidance (against kWh consumption) as energy costs are likely to continue to rise which will have negative impacts on any proposed future saving options.

4.2 Energy costs

4.2.1 Energy costs are calculated by the energy provider using the updated asset register (provided on a monthly basis by CCBC Highways Operations). The register will give the quantum and type of lighting assets CCBC currently hold and the estimated burn hours per night.

4.2.2 Caerphilly's energy is sourced via Crown Commercial Services (CCS) and National Procurement Service (NPS) and street lighting energy consumption, which is in the region of 10million Kwh equating to 5525 tonnes of CO2 annually, this is only around a third of the energy that is used by the authority. This procurement arrangement covers all the energy required by Welsh local authorities.

4.2.3 During 2017/18 the Caerphilly CBC unmetered energy consumption amounted to payments of £1,233,474. Taking this as the base figure, the 13.4% increase will require an additional £165,285 to the Highway Operations budget to stand still.

4.2.4 This increase in energy costs has negatively impacted on the MTFP saving options of £190k already implemented in 2016/17.

4.3 Part night lighting

4.3.1 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 (connecting roads between towns and villages) now being switched to part night lighting (4844 units between midnight and 0530hrs).

4.3.2 Option 3 within Appendix 1 includes the wide spread introduction of part night lighting following LED conversion within all residential areas. While this may seem like a less attractive option, it would reflect a consistent approach to street lighting across the Authority while delivering annual savings of £939,840 and carbon reduction savings of 2836 tonnes. Part night lighting would operate between midnight and 0530 hours.

4.4 Alternatives to Part night Lighting

4.4.1 The switch off option is always an alternative although this has its own significant costs and consequences. It is assumed some 25% of street lights would need to be left operational (junctions, conflict areas and major town centres). Wholescale switch off for all lighting is included as Option 4 within Appendix 1.

4.4.2 Officers are of the view that the best option in relation to switching off lights would be to permanently switch off the existing Part night lighting on the authority's inter urban routes (Option 2) subject to the exemption of Safe Walking routes to school . This option could save £227k annually and can be implemented within 6 months with a payback in less than a year. In addition this will result in less LED replacement lanterns being purchased. Future removal of equipment and WPD energy service connections could cost some £2m to implement, with a payback period of approximately 8 years. Legal advice regarding removal of this equipment has been sought and whilst not necessarily requiring the wholescale removal of redundant equipment each site should be reviewed on an individual risk management basis.

4.4.3 Alternatively reductions in maintenance and energy can be achieved by converting all street lamps to LED (Option 1). At current energy prices savings of £693k can be achieved, however, the implementation costs are estimated to be in the order of £4.25m giving a payback period of approximately 7 years. This option could be reviewed as part of a possible Salix funding bid proposal. Salix provides interest-free Government funding to the public sector to improve their energy efficiency, reduce carbon emissions and lower energy bills. This option would also reduce the authority's carbon reduction commitment payment by approximately £40k.

4.4.4 There are also options to mix and match proposals if there was a desire to pursue this approach. Identified in the appendices are the most common and cost effective proposals to allow members to consider each option and its relative merits. These options are considered by officers to be the most viable for consideration.

4.4.5 Further research and monitoring work is being undertaken to review what future options are available in regard to greener alternatives such as solar power. Currently the costs are not viable. A typical solar powered lamp and column (all columns would need to be changed as they need to be able to accommodate battery storage) would cost approximately £3,500 to install and run against a traditional LED and column installation option which is £1,022. Alternative technologies will continue to be reviewed and monitored to identify at the earliest opportunity options to reduce energy consumption further.

4.4.6 The contract with the current street lighting maintenance contractor has been reviewed and all options identified can be progressed in accordance with our existing contractual relationship. Whichever option is eventually decided upon, officers will seek to confirm with the contractor the resource requirements in order to achieve the proposed delivery and payback requirements and wherever possible, seek to accelerate them.

4.4.7 Alternative partnership approaches with lamp manufacturers have been explored regarding installing and maintaining lamps based on life expectancy but those suppliers have indicated that they manufacture and supply only and do not undertake any form of maintenance, installation works or contract rental. However, these alternative partnership opportunities will actively be explored through our existing contractual framework.

4.5 Summary of Options

4.5.1 It should be noted that Philips Lighting have recently announced that due to falling demand they are to reduce production of Low Pressure Sodium (SOX) lamps from July 2019 with all

production to cease in July 2020. Sources within the lighting industry advise that stocks of these lamps are rapidly diminishing and future deliveries are not guaranteed. Based on previous CCBC use, our contractor holds approximately 12 months' supply of these lamps. Currently CCBC has 1779 SOX lanterns on main roads and 348 within residential areas, these lanterns are currently being replaced with LED alternatives as and when they become life expired.

4.5.2 If the proposal is supported to convert all street lighting to LED this would resolve the issue of having to consider prioritising replacement of the SOX lanterns when stocks become unavailable.

4.5.3 Highlighted below is Option 1 (as indicated in Appendix 1) which Members recommended as their preferred option at the Scrutiny meeting on 15th May 2018:

Options	Cost to Implement in £	Co2 Savings in Tonnes	Annual Financial and Energy Savings in KWh	Payback Period
Option 1 Convert all lanterns to LED	£4,250,000	2,094	5,082,727KWh and £693,873	84 Months

4.5.4 Given the 2018/19 energy price increase of 13.4% (equating to £165,000) and the likelihood of further significant increases in future years, coupled with the budget settlement pressures on the authority, it is recommended that Members further consider additional options in addition to Option 1 to contribute to the MTFP targets and cost avoidance measures that are necessary.

4.5.5 Highlighted below are Options 2, 3 and 4 from Appendix 1 for Members to consider:

Options	Cost to Implement in £	Co2 Savings in Tonnes	Annual Financial and Energy Savings in KWh	Payback Period
Option 2 Permanently switch of the existing part night lighting	£35,073	688	1,670,800kKWh and £227,300	8 Months
Option 3 Convert all lighting to LED and implement part-night lighting to all lighting except junctions and major town centres	£4,546,208	2,836	6,884,477KWh and £939,840	84 Months
Option 4 All lighting to be permanently switched off except junctions and major town centres	£163,184	3,166	7,684,498KWh and £1,049,756	12 Months

Although the full payback periods are quoted as 8, 12 or 84 months, the implementation would start realising a smaller level of savings earlier than this as a result of the phased introduction of part night lighting combined with LED installation and/or switch off.

5. WELL-BEING OF FUTURE GENERATIONS

5.1 This report contributes to the Well-being Goals as set out in paragraph 3.1. It is consistent in all of the five ways of working as defined within the sustainable development principle in the Act that it supports:

5.2 The options provide **long term** resourcing and asset management solutions of this specialised service and allows for more effective and predictable resource/ financial/carbon reduction commitments going forward.

5.3 The reduction in carbon emissions is a commitment to the **prevention** of the long term threat of climate change to which energy reduction plays a key role. Routine maintenance of the highway assets is also a central part of the CCBC **prevention** strategy, thus reducing the need for larger scale repair operations (with the associated safety risks) required for poorly maintained/ inspected assets.

5.4 A well maintained highway forms part of an overall strategy providing efficient **integration** of local roads to regional transport systems on which public transport, private users, cyclists and walking networks can operate.

5.5 **Collaboration** with the Energy team within Caerphilly ensures that the reductions achieved in carbon emissions through efficient street lighting strategies positively contributes to the authority's sustainability targets for carbon reduction.

5.6 Proposed options for energy and carbon savings may require an effective consultation exercise that would require the **involvement** of all relevant stakeholders within the authority depending on the preferred proposal.

6. EQUALITIES IMPLICATIONS

6.1 An Eqla screening has been completed in accordance with the Council's Equalities, Consultation and Monitoring Guidance and some potential for unlawful discrimination and/or low level or minor negative impact affecting one or more of the target equality groups have been identified. A full Eqla has been carried out and the summary and recommendations are included in the Equalities section of this report.

6.2 Dimming or switching off of street lights could have a significantly greater negative impact on people with certain types of visual impairment compared with the majority of the population. It may also affect people whose eyesight is diminishing along with other vulnerable groups such as the elderly and lone persons in terms of feelings of vulnerability and an increased fear of crime.

6.3 Lower energy alternatives to conventional lighting can also have a greater luminance and as a result could have a significantly greater positive impact on those groups mentioned above.

7. FINANCIAL IMPLICATIONS

7.1 Proposed financial savings options are detailed in Appendix 1, which deliver reductions in street lighting energy and street lighting maintenance expenditure to assist with the Council's Medium Term Financial Plan (MTFP) and provide cost avoidance.

7.2 Each option will require investment in order to release the savings towards the MTFP. The preferred financing option would be to progress a Salix funding bid for the preferred energy efficiency proposal. Salix is an interest free Government funding loan to the public sector to improve their energy efficiency, reduce carbon emissions and lower energy bills. To be eligible to be considered proposals need to demonstrate the ability to achieve pay back within 8 years. All options meet the required Salix criteria.

7.3 The current street lighting contract has provisions within it that allow innovation and changes to the street lighting stock to be made. Appropriate rates are also included within the contract that would allow the works to be efficiently procured.

7.4 The scenario outlined within the report is likely to continue and while the detailed proposals show projected savings, it should be noted the proposals should be viewed as a way of cost avoidance as energy costs are likely to continue to rise which will have negative impacts on any proposed future saving options.

7.5 Salix funding would be ring fenced and released to the authority in payment tranches as work progresses. Salix advise that the application is submitted as soon as possible to guarantee the funding.

8. PERSONNEL IMPLICATIONS

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

9. CONCLUSIONS

9.1 Officers views are that the most beneficial approach would be to progress a wholesale conversion of the street lighting stock to LED lanterns. This would meet the Salix funding requirements to achieve a pay back within 8 years and would be implemented over a time period of approximately 45 months and convert all residential lighting to part-night lighting as identified in Option 3.

9.2 The LED conversion would meet the Salix funding requirements. If part night lighting of all residential areas was also considered this could be funded by an 'invest to save' business case which, would have a pay back period of approximately 1 year.

10. CONSULTATIONS

10.1 All comments received from consultees have been taken into consideration and are included in the report.

10.2 A wider consultation process may need to be considered before the implementation of any of the listed street lighting proposals is progressed.

11. RECOMMENDATIONS

11.1 Members are requested to review the options identified within the report and appendices along with the conclusions highlighted in paragraphs 9.1 and 9.2 and provide comments on the proposals for Cabinet to consider.

12. REASONS FOR THE RECOMMENDATIONS

12.1 To allow Cabinet to understand Scrutiny committee views whilst considering their preferred option to achieve street lighting energy and carbon savings to assist in meeting the required MTFP savings and carbon reduction commitment targets.

13. STATUTORY POWER

13.1 Highways Act 1980.

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Consultees: Cllr. Sean Morgan – Cabinet Member for Economy, Infrastructure, Sustainability and Wellbeing of Future Generations Champion
Cllr. Tudor Davies – Chair of Regeneration and Environment Scrutiny Committee
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Mark S. Williams – Acting Corporate Director of Communities
Liz Lucas – Head of Customer and Digital Services
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Nicole Scammell - Head of Corporate Finance and S151 Officer
Robert Tranter – Head of Legal Services and Monitoring Officer
Lisa Lane – Interim Monitoring Officer
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Marcus Lloyd - Head of Infrastructure
Mike Eedy – Finance Manager
Shaun Watkins – Principal Personnel Manager
Anwen Cullinane – Senior Policy Officer – Equalities and Welsh Language
Tom Llewelyn - Senior Engineer
Paul Rossiter – Energy and Water Officer
Sue Ruddock – Insurance and Risk Manager
Tracey Minett – Senior Insurance & Risk Manager

Background Papers:
Highways Act 1980
Part Night Lighting and Future Energy Saving Proposals – Regeneration and Environment Scrutiny Committee – 8th December 2015
Future Lighting and Energy Saving Proposals – Regeneration and Environment Scrutiny Committee – 15th May 2018

Appendices:
Appendix 1 Street lighting options 2018/19

APPENDIX 1

Street lighting options August 2018

To meet the challenges of carbon reduction commitments and reducing budgets within Highways street lighting, the following options have been compiled for consideration. The options are not exhaustive but illustrate some of the energy saving measures available and a mix and match approach where a partial use of some or all of these measures may also be considered.

Despite a 4.5% reduction in kWh through the use of energy efficient equipment, The 2018/19 energy unit rate rose to 13.6516 pence per kWh, a 13.4% increase over the 2017/18 rate of 12.0386 which in itself was a 12.4 % rise over 2016/17. It appears that the overriding impact in terms of the increase is in relation to the 'non-energy' costs set by government being increased, particularly Renewable Obligation / Contracts for Difference, and TNUoS charges. These charges are out of EDF's control, they merely collect the levies and pass them through to the relevant government body and National Grid. According to the information received from the energy proportion had decreased from 40.28% to 36.14%.

During 2017/18 the Caerphilly CBC unmetered energy consumption amounted to payments of £1,233,474. Taking this as the base figure, the 13.4% increase will require an additional £165,285 to the Highway Operations budget to stand still.

All savings are based on the current energy rate of 13.6516 pence per kilowatt hour, the known lamp wattages and the estimated numbers of units affected. The number of street lights identified in each of the options is likely to alter following detailed surveys and risk assessments that determine the items of inventory that must remain in lighting at high risk traffic and pedestrian conflict areas.

Indicated monetary savings relate only to the reduction in kilowatt hours and not from any reduction in equipment maintenance and testing. Additional costs will be incurred when the removal of lighting equipment and Western Power Distribution service connections are required 12 months following any permanent decommissioning.

Should lighting be decommissioned on roads where a speed limit of 50 mph or above exists there will be a requirement to install cats eye type lane markers. No allowance has been made for time or resources in identifying suitable items of inventory for conversion or for mandatory illuminated traffic signs to remain lit following any permanent disconnection of street lighting.

Assumptions made:

Options 2 through 4 require lighting to be extinguished for either part of or the whole period of darkness. A working assumption has been made that in areas affected by these proposals 25% of the inventory will need to remain switched on to maintain Highway safety at high risk traffic and pedestrian conflict areas.

A 12 week delivery of equipment required for any works.

100 lanterns or 200 photocells/disconnections to be carried out per week.

40 units per Western Power disconnection on inter urban routes to be carried out per week.

The column removal costs are £400.00 per column.

WPD disconnection charges are £160.00 per column. Wood pole equipment removal costs are £125.00 per pole.

OPTIONS

1: Convert all lanterns to LED

Number of units affected	17,011	
Cost to implement	£4,250,000	
Co2 savings in Tonnes	2,094	
Energy savings in kWh	5,082,727	
Annual savings in £	£693,873	Allowing for the procurement and installation, the total energy savings per annum will not be realised until after 45 months have elapsed. Payback period will therefore be 84 months.

Note: Should Option 2 be supported, followed by Option 1, the figures in Option 1 would need to be pro rata.

2: Switch off the existing part night lighting with the exception of 370 units on known safe walking routes to schools

Number of units affected	4474	
Cost to implement	£35,073	
Co2 savings in Tonnes	688	
Energy savings in kWh	1,670,800	
Annual savings in £	£227,930	Allowing for decommissioning, the energy savings per annum will not be fully realised until after 6 months have elapsed. Payback period will therefore be 8 months.

Future removal costs for these items of equipment circa £1,782,600 with potential WPD disconnection costs circa £23,000

3: Convert all lighting to LED and implement part-night lighting to all lighting except junctions and major town centres

Number of units affected	15891
Cost to implement	£4,546,208
Co2 savings in Tonnes	742
Energy savings in kWh	6,884,477
Annual savings in £	£939,840 Allowing for the procurement and installation, the total energy savings per annum will not be realised until after 45 months have elapsed. Full payback period will therefore be 84 months.

4: All lighting to be permanently switched off except junctions and major town centres

Number of units affected	20735
Cost to implement	£163,184
Co2 savings in Tonnes	3166
Energy savings in kWh	7,684,498
Annual savings in £	£1,049,056 Allowing for the decommissioning, the total energy savings per annum will not be realised until after 26 months have elapsed. Payback period will therefore be 12 months. Potential future column removal costs circa £2,520,000 Potential future WPD disconnection costs circa £1,250,000 Potential future wood pole bracket removal costs circa £787,500

Although the full payback periods are quoted as 8, 12 or 84 months, the implementation would start realising a smaller level of savings earlier than this as a result of the phased introduction of part night lighting combined with LED installation and/or switch off.