



Committee and Date

Council

19<sup>th</sup> December 2019

Item

Public

**County Wide Street Lighting LED Lantern Replacement Project.  
(Carbon Reduction Programme).**

**Responsible Officer** Mark Barrow – Executive Director Place  
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## 1. Summary

- 1.1 Shropshire Council (SC) wishes to invest within its remaining 16,253 street lights that are located across the county, to replace the traditional street lighting bulbs with LED replacement, and where required replace the street lighting columns. This will allow the following opportunities:
  - Replacement of bulbs to LED, will save future electricity costs and contribute significantly to the Council's Climate and Environment Strategy.
  - Reduced maintenance costs via lower cyclical maintenance frequencies
  - Future revenue savings will be achieved to support the Highways Service Revenue Budget.
- 1.2 Council will also be aware of the Climate Emergency and the current national debate regarding the environment. The LED Conversion Programme will contribute significantly to reduced energy consumption and will be intrinsic to the delivery of the council's environment agenda, by reducing the consumption of electric by 56% over the working period.
- 1.3 The Council currently spends approximately £1.0 million each year on energy for street lighting. Recent projections indicate energy costs for street lighting will rise by between 5% and 14% over the next 10 years which could mean the annual cost increasing to nearly £3.7 million in that time and as high as £13.7 million in 20 years if prices rose by 14% each year. This forecast is clearly unsustainable, and a change in the approach is required.
- 1.4 By investing approximately £6.83 million over 3 years to convert the Council's 16,253 street lights to LED, it would reduce their consumption by 56% saving approximately £506,533 per year (at today's prices) in energy and a reduction in maintenance costs of an estimated £390,899 per year.

- 1.5 The intention of this initiative is to change all existing street lighting over the programme period to new lanterns operating with LED Technology along with pre-programmable photo-electric cells (PECU's) complete with NFC driver which is a user interface to give the Council the flexibility to over-ride the pre-dimming/switch-offs of the lanterns on-street.
- 1.6 In order to achieve the above intention, Full Council is asked to approve that Shropshire Council applies to SALIX (a government agency) for an interest free loan, supported with identified and approved SC finance to deliver a total budget of £6,824,011 for the three years of the programme to deliver the improvements and changes.
- 1.7 The programme of works, subject to approval by Council via an interest free loan being granted by Salix, would be a three year programme beginning in April 2020.
- 1.8 A press and social media campaign would be developed, supported by additional information on the Council's web site, typically this would support the FAQ's document attached in (Appendix 1), which sets out the key information and criteria for wider information.

## **2. Recommendations**

### **2.1 That Council:**

- 1. Approve a funding application to Salix is made requesting £3,034,979 of Capital for the conversion of 16,253 life expired lanterns to energy efficient LED lighting with the funding to be repaid from revenue savings.**
- 2. Approve the draw-down and phased repayment of a £3.03 million interest free loan from Salix for qualifying carbon reduction benefits to reduce the interest charges associated with the capital borrowing requirement**
- 3. Approve the addition of £3,789,032 to the Capital Programme Budget funded by Shropshire Council as the remaining budget requirement to deliver the project.**
- 4. Delegate to the Director of Place in consultation with the Director of Finance and Governance to enter into an agreement with Salix for the works, once all negotiations have concluded.**
- 5. Delegate to the Director of Place to agree, implement and conclude the most efficient procurement route to facilitate the physical works being undertaken over the works period.**

## REPORT

### **3. Risk Assessment and Opportunities Appraisal**

- 3.1 Shropshire Council has reviewed the implications of an investment in the energy efficiency of its street lighting stock and the need for change within its street lighting service is driven by:
- The condition of the existing network and the public and current environmental expectations in relation to street lighting standards and carbon reduction.
  - The requirement to contribute to the Council's carbon reduction plan and Carbon reduction programme.
  - Meeting its strategic objectives in relation to a sustainable, attractive and safe environment.
  - The significant revenue budgetary pressures facing the Council along with ongoing and anticipated energy price increases.
  - The need to secure energy efficiencies, to reduce carbon emissions and to set an example to others in this area.
- 3.2 The Council's specific objectives for any investment in its street lighting include:
- Reducing carbon emissions.
  - Reducing the future burden of energy bills and other associated costs.
  - Meeting current commitments and demands relating to embedding of sustainable practices and the Council's Environment Strategy.
  - Being better prepared for future regulatory requirements.
  - Setting an example to encourage partners and the wider community to make similar changes.
  - Raising the environmental profile of the Council.
  - Improving the stock, outcomes and modernising of the street lighting stock and contribution within our communities.
- 3.3 The selection of the LED lanterns will need to be carefully considered to ensure that Shropshire Council gets best value for money, a reliable unit and the most energy efficient solution.
- 3.4 Replacing approximately 16,253 lights is a major construction project. There will be localised operational disruption as lights are changed and this could include lane closures to safely carry out the work. However, the work involved does not require any excavation or major road works – in most cases the replacement can be fully carried out in 15-30 minutes to each lantern.
- 3.5 Inefficient lamps could be subject to European Regulation, requiring a change to the type of lamp to be considered. The risk is therefore of Shropshire Council not conforming to future regulations, this is a key risk and driver of this initiative.
- 3.6 Shropshire Council has, thus far, not pursued a large-scale transition to LED lighting due to the price of LEDs. The cost of LED lighting units has now fallen notably so the risk is that pursuing the transition now may precede a further decrease in price over time of LEDs. If this was the case, less capital investment

would be required but, for whatever the intervening period might be, SC would continue to have to meet energy costs that are significantly greater than it would be exposed to by converting to LED lighting.

- 3.7 An existing programme of replacement is currently underway which is not considered to impact significantly in negative terms against people with Protected Characteristics.
- 3.8 Screening indicates that the impact in equality terms of this approach towards street light replacements is neutral or positive for protected characteristic groupings in the population. It is assessed as having a positive impact for the groupings of Age, Disability, Pregnancy and Maternity, and Social Inclusion.

#### **4. Financial Implications**

- 4.1 **LED Lantern with Pre-programmable PECU with NFC drivers Project Costs**  
The total project cost for the works and expenditure timeframe is demonstrated below:

<b>PROJECT COST</b>	6,824,011			
<b>SALIX FUNDING</b>	3,034,979	44%		
<b>SHROPSHIRE COUNCIL</b>	3,789,032	56%		
<b>COLUMN REPLACEMENT</b>	0			
<hr/>				<b><u>6,824,011</u></b>
<b>PROJECT COST PROFILE</b>				
	<b>2019/20</b>	<b>2020/21</b>	<b>2021/22</b>	<b>2022/23</b>
<b>PROJECT PROFILE</b>	2,730,000	2,047,000	2,047,010	<b>TOTAL</b> 6,824,010
<b>PROJECT FINANCING TIMEFRAME:</b>				
<b>SHROPSHIRE COUNCIL</b>	1,515,000	1,137,000	1,137,033	3,789,033
<b>SALIX LOAN</b>	1,214,979	910,000	910,000	3,034,979
	<b>2,274,670</b>	<b>2,274,670</b>	<b>2,274,670</b>	<b>6,824,011</b>

- 4.2 The Shropshire Council contribution of £3,789,032, over a three-year time period, will be funded from a combination of grants and reserves where possible, in order to mitigate the cost of borrowing and ensure realisation of the revenue saving at the earliest possible opportunity.
- 4.3 Subject to Council approval, an application for the Salix funding of £3,034,979 will be submitted and terms agreed by the Director of Finance and Director of Place.

- 4.4 Forecast net annual revenue savings have been calculated and are shown in the table below.

	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29
Salix Loan 1		0.243	0.243	0.243	0.243	0.243			
Salix Loan 2			0.182	0.182	0.182	0.182	0.182		
Salix Loan 3				0.182	0.182	0.182	0.182	0.182	
Energy Savings	-0.127	-0.253	-0.380	-0.507	-0.507	-0.507	-0.507	-0.507	-0.507
Maintenance Savings	-0.098	-0.195	-0.293	-0.391	-0.391	-0.391	-0.391	-0.391	0.391
Net Revenue	-0.225	-0.205	-0.248	-0.291	-0.291	-0.291	-0.534	-0.716	-0.898

- 4.5 The table above demonstrates the net effect of the project on revenue budgets, including the repayment of the Salix Loan. Installation will commence April 2020 and partial savings realised in the same financial year of £0.225m. Savings will increase year on year during the installation phase resulting in full year effect of savings by 2023/2024.
- 4.6 During this period the payback of the Salix Loan will commence, starting in 2021/2022 and ending 2027/28. The Loan is on phased three-year drawdown in line with project implementation and is to be paid back over a five-year time frame. Only on full payback of the Salix Loan will the Council benefit from the full annual saving forecast of £0.9m per annum starting in year 2028/29.
- 4.7 Full Council is asked to delegate to the Director of Place and Director of Finance and Governance to enter into agreement with Salix for the works once all negotiations have concluded.

#### 4.8 **Energy Savings:**

Anticipated financial savings from reduced energy costs are as follows:

2020/2021 = £126.6k (25%) – savings will follow the inventory being updated, submitted and approved by the energy supplier so this needs to be considered and the frequency considered,

2022/23 = £253.3k (50%)

2023/24 = £379.9k (75%)

2024/25 = £506,553 (100%) – full year savings after full implementation of project

**Estimated energy savings = £506,553 per annum.**

#### 4.10 **Additional Savings:**

Cyclic Maintenance Bulk lamp change & clean = £298,399 per annum

Annual fault repair = £92,500 pa

Anticipated financial savings from reduced maintenance costs are as follows:

2020/2021 = £97.7k (25%)

2022/2023 = £195.5k (50%)

2023/2024 = £293.2k (75%)

2024/2025 = £390,899 (100%) – full year savings after full implementation of project

**Estimated future maintenance savings - £390,899 per annum**

## 5. Background

- 5.1 Shropshire Council owns and operates 19,596 street lights across its network of which 3,343 lights have already been converted to LED equipment. The remaining lights use various light technologies such as high-pressure sodium (SON) or lower pressure sodium (SOX) and this Project aims to convert these lamps to energy efficient LED technology over a period of 3 years.
- 5.2 Shropshire Council has already introduced part-night lighting across its lighting stock where possible but the provision of LED lighting will enable us to meet our commitments in terms of energy, both usage and levels of carbon reduction as well as financial efficiencies, which will support the Council's wider environment agenda
- 5.3 During 2019 the production of SOX lamps will cease and given that Shropshire currently uses some 8,336 lamps of varying wattages, or 42.5% of its stock, this will mean that as these lamps fail over the next three years or so the Authority will be forced to replace these lanterns completely on an ad-hoc basis if it wishes to continue to light its streets.
- 5.4 The Council is committed to reducing costs and its impact on the environment. This project meets these objectives by the implementation of a LED conversion programme which will give the opportunity to deliver the following improvements:
- By changing the Authorities light profile to use LED technology, it will reduce its energy consumption by some 56% on completion of the Project, which in turn will impact on its Carbon Footprint and reducing that by 794.5 tonnes of CO<sub>2</sub> per annum contributing towards Carbon emission saving targets.
  - Reduction in the frequency of maintenance, which will reduce the number of visits and traffic management required. This will have a direct effect on the amount of disruption to the highway network and will reduce the monthly revenue spend.
  - The reduction in upward light emissions, to support a darker sky initiative.
  - The provision of pre-programmable PECUs complete with NFC drivers which is a user interface to give the Council the flexibility to over-ride the pre-dimming/switch-offs of the lanterns on-street
- 5.5 A number of energy-saving options have already been introduced in the County to offset previous increases in the energy costs associated with the street lighting service.

5.6 These include:

- Switching the street lighting off where lights were no longer necessary or over provided for.
- Part-night lighting between the hours of midnight and 05:30 on risk assessed routes.
- Dimming on LED lanterns replaced in the last 5 years on the County's lighting units between the hours of 22:00 and 05:30 on main roads in areas where Part-night lighting does not apply.
- Trimming all lighting switch on and off times to minimise burning hours reducing energy usage.
- Changing approximately 3,300 lanterns to LED lighting as part of the column replacement programme.

5.7 Despite the significant amount of energy efficiency work carried out over the past five years on the network, there remains a significant proportion (77%) of the inventory made up of the conventional sodium units SON and SOX lamps.

5.8 The preferred option going forward would be to replace all the remaining lanterns with modern and energy efficient LED lanterns. The design and reliability of LED lanterns has improved greatly over the last decade, with the latest technology producing a clearer white light, providing higher lumen output from a much lower wattage, thereby using less energy, and producing lower carbon emissions than the current lanterns. The cost of these lanterns has also fallen significantly in recent years as demand for new and more energy efficient solutions has grown.

5.9 The new and more energy efficient LED lanterns can provide energy savings of up to 73% (depending on light output) when compared to the existing units however, despite the reducing purchase costs, a large initial capital investment is still required to procure the new units.

5.10 In order to assist and improve public information a FAQ's paper has been developed (Appendix 1) to update on the possible questions and provide a rationale and technical guidance on what the programme is, how it will be managed and rolled out. The intention is the council's web site will be updated and a press and social media campaign would be developed to ensure that information is disseminated in advance of the programme being rolled out.

5.11 Typically questions revolve around the "shade" of light, is it safe? And if existing older lamps fail, will they be replaced if included in a programme? All of which are included in the FAQ's.

## 6. Procurement

6.1 In order to facilitate the works, the Council's existing Term Maintenance Contractor could provide works to an agreed competitive budget and performance regime, or the works could be tendered to direct competition subject to approval and assessment of the most efficient and value for money method being assessed, and full Council to delegate authority to the Director of Place to implement the most efficient method.

**List of Background Papers (This MUST be completed for all reports, but does not include items containing exempt or confidential information)**

**Well Maintained Highways / Well Lit highways code of practice**

<http://www.ukroadsliaisongroup.org/en/utilities/document-summary.cfm?docid=220C1896-5D20-4A54-B010156913910E69>

**Cabinet Member (Portfolio Holder)**

Cllr Steve Davenport

**Local Member**

Countywide project

**Appendices**

Appendix 1 - FAQ briefing note for public information

Appendix 2 - Equality and Social Inclusion Impact Assessment (ESIIA)