Coventry City Council

Public report
Cabinet

Cabinet — 10th December 2024
Council — 14th January 2025

Name of Cabinet Member:
Cabinet Member for City Services

Director approving submission of the report:
Director of Innovation

Ward(s) affected:
All

Title:
PFI Street Lighting LED Upgrade

Is this a key decision?
Yes - the report relates to an issue which impacts all 18 electoral wards and Council expenditure is greater than £10m.

Executive summary:

This report seeks approval from Cabinet and Council to approve investment of £10.28m to progress with the upgrade of the majority of the city's streetlights (29,500) to LEDs.

In 2023/24 the Authority spent £3.4m on energy for streetlights; based on 38p kwh. We have an opportunity to reduce revenue costs by investing in energy efficient LED street lighting technology, which use approximately 50% less energy than our current lights. LEDs also have a much lower maintenance requirement. Overall, this will result in savings of over £900k based on current consumption which will more than cover the borrowing cost as well as delivering all the other benefits. The lower energy consumption will result in a reduction of our carbon emissions by 1200 tonnes per annum.

LEDs will provide resilience to changes in energy prices which can be impacted by world affairs. LED lighting will provide the City Council with the opportunity to dim the lights to as low as 30% whilst still providing the same quality of our current lighting at 50% dim. This will enable a review of the part night switch off policy and to potentially generate additional savings.

The LED upgrade also offers the opportunity to help make Coventry a 'Smart City' by incorporating smart sensor ports in 1 in 5 of the new lanterns. This will offer opportunity to easily collect environmental data (air quality, noise, or traffic flows for example) across the whole city.

Recommendations:

Cabinet is recommended to request that Council:

1) Approves capital expenditure of up to £10.28m to be financed from borrowing, to fund the LED upgrade of up to 29,500 streetlights with up to 1 in 5 having smart sensor ports.

2) Delegates authority to the Director of Innovation and the Director of Law and Governance and the Director of Finance and Resources, following consultation with the Cabinet Member for City Services, to enter into and finalise the financial and legal terms necessary to implement the LED upgrade via the appropriate mechanism contained within the PFI Streetlighting Agreement.

Council is requested to:

1) Approve capital expenditure of a maximum of up to £10.28m to be financed from borrowing, to fund the LED upgrade of up to 29,500 streetlights with up to 1 in 5 having smart sensor ports.

2) Delegate authority to the Director of Innovation, Director of City Services & Commercial and the Director of Law and Governance and the Director of Finance and Resources, following consultation with the Cabinet Member for City Services, to enter into and finalise the financial and legal terms necessary to implement the LED upgrade via the appropriate mechanism contained within the PFI Streetlighting Agreement.

List of Appendices included:

Appendix 1 – Equality Impact Assessment Form

Background papers:

None

Other useful documents

None

Has it or will it be considered by Scrutiny?

No – however the matter will be considered by the Communities and Neighbourhoods Scrutiny Board (4) on 30th January 2025

Has it or will it be considered by any other Council Committee, Advisory Panel or other body?

Leadership Board: 09 July 2024
Member Briefing: 25 July 2024
Political Cabinet: 07 October 2024
Labour Group: 21 October 2024

Will this report go to Council?

Yes - 14th January 2025

Report title: PFI Street Lighting LED Upgrade

1. Context (or background)

1.1 In 2010 the Authority entered into a 25-year Street Lighting PFI (Private Finance Initiative) to upgrade and manage 38,000 illuminated assets which included 32,000 streetlights. At the time of award, LEDs were considered, but due to the infancy in technology, high unit costs and quality of the light output, it was not seen as a viable option at the time. In the last 14 years the technology used in LEDs has evolved with the Light Emitting Diodes becoming cheaper, more efficient in energy usage and there is now the ability to choose a warmer colour temperature more suitable for residential environments.

1.2 Over recent years, global uncertainty has resulted in energy prices more than doubling from 15p/kWh in 2019 to a peak of 38p/kWh in 2023. In order to combat the increasing energy costs, the Authority has had to take tough decisions to keep costs under control by dimming the lights in most streets from switch on and then part night switch off from midnight to 5.30am. The Authority is also facing financial pressure from reduced funding but a demand on its services. This, coupled with the improved efficiency and reduced costs of LEDs, has made the business case for converting the city's street lighting to LED much more compelling. A further consideration is that the manufacture of non-LED lanterns is being discontinued meaning that conversion to LED will be inevitable by the end of the PFI.

1.3 LED lanterns have a life that is four times as long as our current street lights. This will result in a maintenance saving of £1.7m during the remainder of the PFI contract. Our PFI provider, Balfour Beatty, has offered the City Council the opportunity to have this saving up front which would enable us to reduce our borrowing requirement by £1.7m (down to £8.52m)

1.4 The cost of borrowing for the LED upgrade will be covered by the energy savings made from the reduction in energy used by the LED lanterns with a payback predicted in approximately 10 years; based on an average energy price of 26p/kWh. Overall, this will result in savings of over £908k based on current consumption which will more than cover the borrowing cost and provide a surplus of £18.7k. Refer to table 3.

1.5 Another big advantage of LEDs is that they can be dimmed to 30% whilst still offering a light level equivalent to our current lanterns operating at 50%. This offers much greater flexibility in terms of lighting options, meaning the part night light switch off policy can be reviewed. For example, we could explore the savings delivered by dimming the lights to 30% from 10pm and then to leave them at that level for the remainder of the night. Equally additional savings could be derived by dimming to 30% before 10pm. It should be noted that Derby City Council have converted to LEDs and dim to 30% from 11pm every evening.

1.6 210 Councils across the UK are in the process of converting streetlights to LED with an annual spend of approximately £1.07 billion nationally. We have not needed to consider upgrading to LED until now due to the advanced lighting technology installed in 2010 which allowed us to control and dim street lights to 55% remotely. As explained in 1.1 the business case for conversion has only recently become positive.

1.7 In developing the business case, alternative lighting options have been considered including solar and solar hybrid LED lanterns. These have been discounted for a number of reasons, including cost (more detail is provided in section 2 – options considered).

1.8 A successful LED trial has been implemented in the Hillfields area which has received positive feedback from residents and ward councillors. All new street lighting installations are LED in line with our Street Lighting Development Specification document.

1.9 The PFI partnership has been very successful and has reduced our energy & CO2 consumption by 73,599,228 kwh, 60,2898 tonnes and a mitigated saving of £14,747,435 to date. The improved efficiency of the LEDs will further reduce annual carbon emissions by 1200 tonnes, furthering the ambition to become a net zero city.

1.10 There are additional environmental benefits too. The life of an LED lamp is 4 times that of a conventional lamp. This reduces the use of raw materials including approximately 2.5 tonnes of various materials such as porcelain, Nickel, Aluminium, Stainless Steel, Copper, Non-Ferrous Alloys and plastics. We are working with Warwick Manufacturing Group (WMG) to explore opportunities for recycling the old 29,500 lanterns which will stop parts being sent to landfill. WMG estimate that there are around 125 tonnes of aluminium alone that can be recovered.

1.11 There will also be benefits for wildlife. Installing LEDs with a warm colour temperature (3000 kelvin) and the ability to dim means they also have less of an impact on wildlife at night. Blue light impacts wildlife, but the 3000kelvin colour temperature is on the lower scale of the blue light spectrum. Excessive light can disrupt the natural cycle of invertebrates who pupate in the first inch of the topsoil, causing their early emergence. This has a knock-on effect up the food chain and the predation cycles in small mammals such as bats. In addition, shields can be fitted to all LED lanterns to combat any unwanted light impacting wildlife or residents.

1.12 As part of the LED upgrade it is proposed to incorporate sensor ports in 1 in 5 streetlights as a major step forward towards making Coventry a ‘Smart City’. This would enable a variety of sensors to be easily plugged in, thus reducing the current installation costs (drilling lighting columns will no longer be required). These sensors can collect a wide variety of data such as traffic flows, air quality and noise. The sensors can also be interchanged between locations allowing the Authority to collect data where it is required. The use of multi-sensors collects multiple data sets from one location, using one sensor. This removes the need for individual sensor per application, thus saving on further installation cost. Other innovations include the use of lighting columns to accommodate Electric Vehicle charge points in association with ‘Charge Gully’, so that there are no charging cables running across pavements (as most lighting columns are located at the back of the pavement).

2. Options considered and recommended proposal

2.1 Do Nothing: This option is not preferred as ultimately the current streetlights will become redundant and the Council will be faced with having to replace all of them at the end of the PFI contract at the latest. Not proceeding with the upgrade would also forgo the opportunity to reduce carbon emissions and to achieve the greater flexibility

LEDs offer, including the opportunity to explore other part night lighting options that could deliver more savings for the Council, whilst also offering better quality lighting.

2.2 Alternative Technologies: Solar and Solar Hybrid LED lanterns have been considered, but the costs of the lanterns and associated additional materials makes this option too costly (Approximately £1400 additional per unit). Furthermore, the extra weight of the equipment could mean many existing lighting columns, which still have a 25-year lifespan, are having to be replaced. Solar energy can only be used for a maximum of eight months of the year and does not provide enough energy to power streetlights all night long, except potentially the shorter summer nights. To operate for the longer nights there would not be enough stored energy and would have to revert to using energy from the Grid. We would also need to reconsider the location of some of the streetlights, as solar power requires streetlights to be positioned in places to get as much light as possible to be effective. This would also mean increased costs.

2.3 LED upgrade: this option is recommended as it will lengthen the life of the City's streetlighting assets to 2050 and deliver further financial and carbon savings, including the opportunity to review the part night switch off policy by exploring the ability to dim to 30%. The Authority's energy usage before part night is 8,460,570kwh, energy saving from part night is estimated at 2,058,808kwh. However, a projected 4,899,785 kwh reduction in energy usage can be realised from converting to LED and operating in line with the current policy. The improved efficiency of the LEDs will further reduce annual carbon emissions by 1200 tonnes. In addition to energy saving, LED lanterns allow for the integration of sensor ports. It will provide an infrastructure to install sensors on almost every street in the city, thereby moving the Authority closer to becoming a "Smart City". This will enable the Authority to explore other innovation now being used with street lighting.

3. Results of consultation undertaken

There has been no consultation.

4. Timetable for implementing this decision

Cabinet Approval	December 2024
Design Work	January to April 2025
Legal Framework Agreement	February to July 2025
Finalise Commerial Agreement	April to July 2025
Council Sign & Seal	July 2025
Material Order	July to November 2025
Installation	November 2025 to November 2027

Timeline is subject to approval. There may be options to accelerate the programme that can be discussed with the PFI provider.

5. Comments from the Director of Finance and Resources and the Director of Law and Governance

5.1. Financial Implications

The following assumptions have been built into the revenue calculation:

Table1: Assumptions

	Assumption	Comments
2023/24 KWH usage (pre part night)	8,460,570	Data taken from 2024/25 bills
KWH saved – part night only	2,058,808	Estimated reduction in energy usage from implementation of part night (as 2024/25 budget setting). Assumes no LED investment
KWH saved from LED + part night	4,899,785	Total estimated reduction in energy usage from investment in LED and implementation of part night
£ per kwh	£0.26	Current price is £0.22. £0.34 was assumed in calculating the existing £0.7m target and allows us to compare the LED proposal to Part night switch off only and reduce the risk of overstating the additional saving in comparison to the do minimum.
Part night	2/3	Switching off two in every three streetlights
Lighting level	63%	Current lighting level is 63% brightness (Flexibility to dim further to 30%)
Interest rate	5.5%	Based on current interest rate

5.1.1 **Capital impact**

It is estimated that the LED project would require a total capital cost of £10.28m, which is the cost of converting 29,500 streetlights to LED, installing sensors on 1 in 5 streetlights and legal cost for updating existing contract with our PFI provider. The project is expected to be financed from borrowing at 5.5% over 20 years. See Table 2 below for full breakdown of capital cost.

Table2: Capital expenditure

Capital Expenditure	Cost £'000
LED Conversion	9,886.5
Design Cost	63.1
Extended Warranty	145.7
Smart City	84.6
Legal Cost	100.0

Total borrowing requirement	**10,279.9**

5.1.2 **Revenue impact**

The Council's energy budget for Streetlighting has an existing saving target of £0.7m as a result of the decision made to implement the part night switch off. If energy prices reduce, this saving will be met from a combination of price reduction and reduction in kwh used from the part night switch off. The table below intends to show the additional saving per annum that could be generated if the decision is made to invest in LED streetlights in comparison to existing scenario where streetlights are on Part Night switch off only.

Table3: Revenue impact

Revenue implications	**Option A** **Do minimum - part night only (Current scenario)** **£'000**	**Option B** **LED investment + part night (Recommended option)** **£'000**
Cost of energy (26p per kwh)	**2,199.7**	**2,199.7**
Energy saving from Part Night	-535.3	-535.3
Additional energy saving from LED replacement	0.0	-738.7
Maintenance saving	0.0	-170.0
Energy cost of option	1,664.4	755.7
Repayment cost (20 years at 5.5%)	0.0	889.9
Total cost of option	**1,664.4**	**1,645.6**
Total saving at revised unit cost of energy	**-535.3**	**-554.0**
Additional saving compared to Part night only		18.7

Based on the options presented in Table 3, and the assumptions set out in Table 1, the LED project is expected to deliver an additional saving to the Council of £0.02m per annum when combined with the part night switch off.

5.1.3 **Comments on energy price assumptions**

The business case for LED investment is heavily reliant on energy price, which has been very volatile in recent years. Energy price per KWH has risen by 153% between 2019 (£0.15) and 2023 (£0.38). Although unit price per KWH is beginning to come down,

it is still very unpredictable. A reduction in energy price would provide the Authority with an increased inflationary saving but lower additional saving for LED investment when compared with the "do minimum" option. If energy price falls (and stays) below £0.26p, the Council will be better off financially with the "do minimum" option.

Conversely, an increase in energy price would create an inflationary pressure for the Council to manage, and investing in LED streetlights would serve as a buffer against such future inflationary pressure.

5.1.4 **Other options**

There could be an option for the Council to take the maintenance saving upfront. The terms of this option will be reviewed along with the benefit, to determine its suitability.

5.2. **Legal Implications**

The implementation of the LED upgrade will be contractually agreed via the appropriate mechanism contained within the PFI Streetlighting Agreement with the Council's legal services providing the necessary oversight and input.

6. Other implications

6.1. **How will this contribute to the One Coventry Plan?**
(**https://www.coventry.gov.uk/strategies-plans-policies/one-coventry-plan)**

The LED proposal contributes to the Plan's Vision **- Working together to improve our city and the lives of those who live, work and study here**":

Tackling the causes and consequences of climate change

By consuming less electricity to produce the same or even better lighting output, LED lights directly contribute to lowering the carbon footprint of urban areas.

Other than the straight energy and carbon saving from energy production, environmental benefits such as reduction in light pollution and saved raw materials can also be realised.

Carbon can also be saved in not producing and recycling lamps. The use of approximately 2.5 tonnes of various materials such as porcelain, Nickel, Aluminium, Stainless Steel, Copper, Non-Ferrous Alloys and plastics, can all be avoided.

Continued financial sustainability of the Council

In addition to the energy cost saving, the conversion would also lead to operations and maintenance (O&M) cost saving as LED luminaires last at least four times longer than traditional bulbs, thereby requiring less frequent replacement. The Authority has the option to take the maintenance savings upfront or on a monthly/annual basis. This can help ease the Authority's financial burden.

The efficient modern technology of LED Lanterns and energy efficient lamps will reduce the burden of the electricity bill.

The reduced energy consumption provides an element of resilience to future energy price increases.

Council's role as a partner, enabler and leader

LED street lighting enables the Authority to demonstrate we are leading and co-ordinating Coventry's response on how the city tackles challenges and opportunities associated with climate change and working with partner organisations to improve the quality of the lives of local residents.

6.2. **How is risk being managed?**

6.2.1 There are no risks associated to the lighting with the LED upgrade; it actually provides the Authority with a better-quality inventory when the PFI comes to an end and options to review the current street lighting policy. The lighting will still be managed and maintained by our PFI street lighting team until the end of the contract.

6.2.2 The risk of delivering the project on time sits with Balfour Beatty as long as the Authority signs off in line with the timescales provided.

6.2.3 There is a risk that energy prices could fall below a level that makes the LED investment not financially viable when compared to the "do minimum" scenario. However, the long-term nature of the investment gives it the ability to ride out market fluctuations.

6.3. **What is the impact on the organisation?**

There will be no Impact on staffing / human resources, information and communications technology, accommodation, assets, or the council's corporate parenting responsibilities. The management & implementation will be handled by our PFI street lighting partner.

6.4. **Equalities / EIA?**

An equality impact assessment has been undertaken to inform this decision; the introduction of LED lighting will have a positive impact on all groups in society by providing better lighting.

6.5. **Implications for (or impact on) climate change and the environment?**

The calculated annual reduction in CO2 emissions is 1200 tonnes with approximately 13,200 tonnes of carbon to be eliminated over the remainder of the PFI project. LEDs allow a reduction in wasted light or cutting out nuisance light into properties and into green spaces such as hedgerows therefore not disrupting the natural cycle of invertebrates who pupate in the first inch of the topsoil, causing their early emergence. Carbon can also be saved in not producing and recycling lamps. The use of approximately 2.5 tonnes of various materials such as porcelain, Nickel, Aluminium, Stainless Steel, Copper, Non-Ferrous Alloys and plastics, can all be avoided.

6.6 **Implications for partner organisations?**

The LED upgrade will provide all stakeholders with a better quality of street lighting.

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