

**Meeting:** Finance Sub-Committee

**Date:** 18 October 2017

**Title:** Street Lighting PFI energy consumption reduction

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**Authors:** Paul Nelson - Environmental Sustainability & Street Lighting Manager, David Anderson – Principal Accountant (Advisory)

Tel: 0191 643 6467/5722

**Service:** Environment, Housing & Leisure / Finance Service

**Wards affected:** All

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**1. Purpose of the Report**

1.1 At a previous meeting of Finance Sub Committee, there was a request for a report on the Street Lighting PFI, to include information explaining recent investment that has led to reduction in energy usage.

**2. Recommendations**

2.1 Finance Sub Committee are asked to note the content of the report.

**3. Detail**

Initial scheme

3.1 When the Street Lighting PFI scheme commenced in 2004, it was projected that an increase in the number of lighting columns and an improvement in lighting levels would culminate in an increased electricity consumption of 17.612m kWh per annum from 2009/10 to the end of the contract in 2029/30. Any electricity consumption over this amount would be the responsibility of the service provider to fund. Since 2012/13, there have been a number of initiatives that have reduced the energy consumption to current level. As per the project agreement, energy savings resulting from a service provider investment or initiative are shared 50/50 between the service provider and the Authority. Energy savings resulting from an Authority investment or initiative are fully retained by the Authority.

Energy saving projects

3.2 De-illumination of traffic bollards – In 2012/13, 836 traffic bollards were de-illuminated, removed and were replaced with retro-reflective self-righting bollards. The full-year effect of this scheme was a reduction of 183,329 kWh per annum, equivalent to a full year saving of £0.021m in electricity charges. There is also a reduction in Carbon Reduction Commitment charges of £0.001m.

- 3.3 Traffic signs LED – In 2012/13, 968 illuminated traffic signs lamps were replaced with energy efficient LED lamps. The full-year effect of this scheme was a reduction of 36,066 kWh per annum, equivalent to a full year saving of £0.004m in electricity charges. There is also a reduction in Carbon Reduction Commitment charges of £263.
- 3.4 GE Streetwise / 'Trimming and Dimming' – In 2014/15 more efficient lamps were installed to circa 10,200 street lighting columns and the 'Mayflower' Central Management System (CMS) was installed to control the timing and burning strength of the lamps. These lamps are brought on 20 minutes later on an evening and switched off 20 minutes earlier on a morning, compared to a standard 'dusk to dawn' operating programme. They are also operated at 75% burning capacity from switch on, reducing to 65% between midnight and 05:30. The full-year effect of this scheme was a reduction of 2,254,530 kWh per annum, equivalent to a full year saving of £0.257m in electricity charges. There is also a reduction in Carbon Reduction Commitment charges of £0.016m.

The Authority invested £0.500m in this scheme.

- 3.5 Part Night Switch Off – In 2014/15 the Mayflower CMS was installed on circa 3,100 columns to switch the lamps off between midnight and 05:30. The full-year effect of this scheme was a reduction of 1,088,339 kWh per annum, equivalent to a full year saving of £0.124m in electricity charges. There is also a reduction in Carbon Reduction Commitment charges of £0.008m.

The Authority invested £0.200m in this scheme.

- 3.6 SOX to Cosmo - In 2014/15, 1,447 older inefficient lamps were upgraded to a more efficient lamp. The full-year effect of this scheme was a reduction of 95,880 kWh per annum, equivalent to a full year saving of £0.011m in electricity charges. There is also a reduction in Carbon Reduction Commitment charges of £0.001m.
- 3.7 Coast Road – In 2014/15, 380 columns on the Coast Road were dimmed to meet the appropriate lighting classification. The full-year effect of this scheme was a reduction of 193,469 kWh per annum, equivalent to a full year saving of £0.022m in electricity charges. There is also a reduction in Carbon Reduction Commitment charges of £0.001m.
- 3.8 Sensor changes – In 2016/17 the sensors on 1,690 columns were changed so that the columns come on slightly later and go off slightly earlier. The sensors were replaced as part of the normal lifetime replacement programme. Modern lamps get up to full burning capacity much quicker than older lamps and this change is reflective of that. The full-year effect of this scheme was a reduction of 4,816 kWh per annum, equivalent to a full year saving of £548 in electricity charges. There is also a reduction in Carbon Reduction Commitment charges of £35.
- 3.9 SOX to LED – In 2016/17, 292 older inefficient lamps were upgraded to LED. The full-year effect of this scheme was a reduction of 48,981 kWh per annum, equivalent to a

full year saving of £0.006m in electricity charges. There is also a reduction in Carbon Reduction Commitment charges of £357.

- 3.10 LED – In 2017/18 a programme to replace 7,300 existing lamps with LED commenced. The programme will be completed in 2018/19 and the full-year effect of this scheme will be a reduction of 3,436,194 kWh per annum, equivalent to a full year saving of £0.391m in electricity charges. There is also a reduction in Carbon Reduction Commitment charges of £0.025m.

Saving on consumption and energy price effect

- 3.11 The combined saving on energy consumption is in the table below:

	<b>Kilowatt hours, kWh</b>
Contract forecast consumption	17,611,959
<b>Electricity reduction project</b>	
De-illumination of traffic bollards	- 183,329
Traffic signs LED	- 36,066
GE Streetwise / trimming and dimming	- 2,254,530
Part Night Switch Off	- 1,088,339
SOX to Cosmo	- 95,880
Coast Road	- 193,469
Sensor changes	- 4,816
SOX to LED	- 48,981
<b>Revised annual usage 2016/17</b>	<b>13,912,194</b>
LED programme (completed 2018/19)	-3,436,194
<b>Revised annual usage once LED programme completes</b>	<b>10,476,000</b>

- 3.12 These electricity reduction projects have contributed to an overall reduction in electricity consumption below the contractual cap of 21%.
- 3.13 At present, the cost of electricity for street lighting is 11.385p per kWh, which represents a full year cost, as at 2016/17 consumption, of £1.584m. These electricity reduction projects (excluding the main LED project which is still to be delivered) have led to a full year reduction in energy charges of £0.445m, compared to the forecast consumption total. There is also a reduction in Carbon Reduction Commitment charges of £0.028m.
- 3.14 The projects have also helped to reduce the carbon footprint of the street lighting portfolio by 3,873 tonnes, or 40%.
- 3.15 Although the projects have significantly reduced the electricity consumption, the electricity unit rate has increased from 0.038p per kWh at the start of the contract, to 0.11385p per kWh at current rate. The average unit rate per kWh is in the table below for each year of the contract;

<b>Year</b>	<b>Average unit rate</b>
<b>2004-05</b>	0.038
<b>2005-06</b>	0.038
<b>2006-07</b>	0.038
<b>2007-08</b>	0.061
<b>2008-09</b>	0.061
<b>2009-10</b>	0.087
<b>2010-11</b>	0.068
<b>2011-12</b>	0.083
<b>2012-13</b>	0.095
<b>2013-14</b>	0.100
<b>2014-15</b>	0.099
<b>2015-16</b>	0.106
<b>2016-17</b>	0.110
<b>2017-18</b>	0.114