

Street Lighting Energy Reduction Project – Update

SUMMARY

- 1.1 The energy required for street lighting in Derby costs around £1.25 million per year and produces over 6,177 tonnes of carbon emissions (CO₂) based on 2013 figures. This accounts for 18% of the Council's total CO₂ emission
- 1.2 Energy costs have increased by more than 56% between 2007 and 2013 which is an increase of more than 8% year on year. Recent announcements have shown that trend to be slowing but the market is volatile and the overall trend is still for prices to increase.
- 1.3 In September 2013 Cabinet approved an 'invest to save' project to install Central Management Systems (CMS) and control nodes, on 6000 of our highest energy using lanterns. The CMS gives the ability to control lighting levels and enables us to provide the right amount of light, based on use, at any given time. This saves wasted energy from over lighting areas when it's not necessary to do so. The project aims were to have the right lighting levels, in the right place, at the right time.

The installation has taken place during 2014/15, during which we will realise part savings as installation occurs. The first full year of operation will be 2015/16

- 1.4 This report updates on the progress of the scheme and shows that so far during the installation year we have:
 - Upgraded and put in place dimming regimes on 5045 out of 5967 lanterns with the remaining 922 to be installed by the end of March 2015.
 - Saved 589,842 kWh in the nine months since installation began, which equates to a saving of £44,612 in energy costs.
 - Reduced our CO₂ output by 319 tonnes which equates to a saving of £5,105.

Projected full year savings are included in section 4.9.

RECOMMENDATION

- 2.1 To note the contents of the report and recognise the progress made and the savings achieved to date

REASONS FOR RECOMMENDATION

- 3.1 To reduce the revenue burden from increasing energy costs and to provide flexibility and control in our street lighting stock for the future.
- 3.2 To reduce the carbon footprint of our street lighting inventory.

SUPPORTING INFORMATION

4.1 Background Information

Our service provider, Balfour Beatty Living Places, maintains and operates approximately 30,250 street lighting units throughout the city under a 25 year PFI contract on our behalf. We remain responsible for the procurement and purchase of energy.

- 4.2 The energy required for street lighting in Derby currently costs around £1.25 million per year. Unmetered energy costs have increased by more than 56% between 2007 and 2013 which is an increase of more than 8% year on year. This rise has slowed more recently but the energy market is volatile and prices will increase. The Street Lighting team and our service provider are constantly looking at ways to reduce the burden of our energy costs.
- 4.3 The street lighting network also contributes to our carbon footprint by producing over 6,177 tonnes of carbon emissions (CO₂) based on 2013 figures. This accounts for 18% of the Council's total for CO₂ emissions.
- 4.4 Advances in modern street lighting technology, coupled with the lower and variable lighting levels permissible by the revised British Standards (BS 5489) and EN 13201, means that it is now feasible to achieve energy savings by means of reducing the wattage of the lamps through dimming.

4.1 Project Summary

The investment project aimed to install Central Management Systems (CMS) and control nodes to 6000 of our highest energy using lanterns, on traffic routes. This would allow the lighting levels to be controlled and dimmed during off peak periods.

- 4.2 Traffic flows on many of our roads between the hours of midnight and 6am are significantly lower than those during peak hours in the morning and evening rush hour. The CMS technology now allows us to vary the level of lighting during these hours of lower traffic flows.

- 4.3 The streets included in the project, were individually assessed and a typical dimming profile was set as dimming by 30% after 8pm, dropping again to 50% from 11pm, before raising levels back to the 30% dimmed level in time for early morning traffic. These levels were adjusted individually depending on risk factors such as junctions and traffic levels.
- 4.4 Residential areas were not considered due to the high costs of installation in comparison to energy usage and potential savings.
- 4.5 **Original Financial summary.**
The project allowed for a programme of installation during the 14/15 financial year which meant that full savings would not be realised until the first full year of operation which will be 15/16. The original financial summary was as follows.
- The capital cost of purchasing and installing the new equipment = £1.36 million.
 - The energy saved from dimming the 6000 columns = £160 k per year.
 - The borrowing costs were £ 127 k per year
- This resulted in predicted revenue saving of £ 33 k per year.**
- 4.6 **Progress to date**
The initial site visits with Councillors and other stakeholders such as the police went well with no one present being able to tell the difference between those columns which had been dimmed by 30%, those which had been dimmed by 50% and those which remained unaltered. This gave a good level of confidence to all present.
- 4.7 Installation has gone well, with our contractor making maximum use of existing planned road closures to reduce costs. 5045 lanterns have been upgraded and the remaining 922 control nodes will be installed by the end of the financial year. Dimming profiles have been set for all those installed so far, in line with the limits set in the cabinet report.
- 4.8 Our street lighting equipment has been upgraded during the current financial year (2014/15). Savings are therefore being realised as equipment is installed and dimming profiles are set. The first full year of operation will be 2015/16 when full savings will be realised.
- 5045 / 5967 lanterns have been upgraded and dimming regimes put in place, with the remaining 922 to be installed by the end of March 2015.
 - In the nine months during installation we have saved 589,842 kWh which equates to a saving of £44,612 in energy costs.
 - We have also reduced our CO2 output by 319 tonnes which equates to a saving of £5,105.

4.9 **Projected savings for 2015/16**

Due the increasing costs in the energy market, a direct saving comparison in monetary terms is very difficult. The only direct comparison is in energy consumption. The unfortunate truth is that most of the financial reward from energy saving measures will be absorbed by rising prices. Effectively energy saving schemes help to reduce the impact of price rises and guard somewhat against the increasing burden. What is certain is that if schemes such as this were not undertaken, energy costs would easily outstrip the available budget.

4.10 Energy consumption figures based on installation of all 5967 units

Energy Consumption 2013/14	= 12,377,417 kWh
Projected energy consumption 2015/16	= <u>10,861,107 kWh</u>
Energy saving due to project	= 1,516,310 kWh

A reduction of over 12%.

Saving 1,516,310 kWh at the current pence per kilowatt hour of £0.10598, (negotiated for the period of October 2014 to September 2015) equates to a saving of £160,698.53. This will be offset against the increase in energy costs for the remaining street lighting stock.

The best way to view the impact is in terms of total energy costs.

Energy costs 2015/16 = 10,861,107 kWh x 0.10598 = £1,151,060.10

Energy Costs 2013/14 = 12,377,417 kWh x 0.10186 = £1,260,763.60

In real terms, when factoring in increasing energy costs, the financial saving from the project is £109,703.

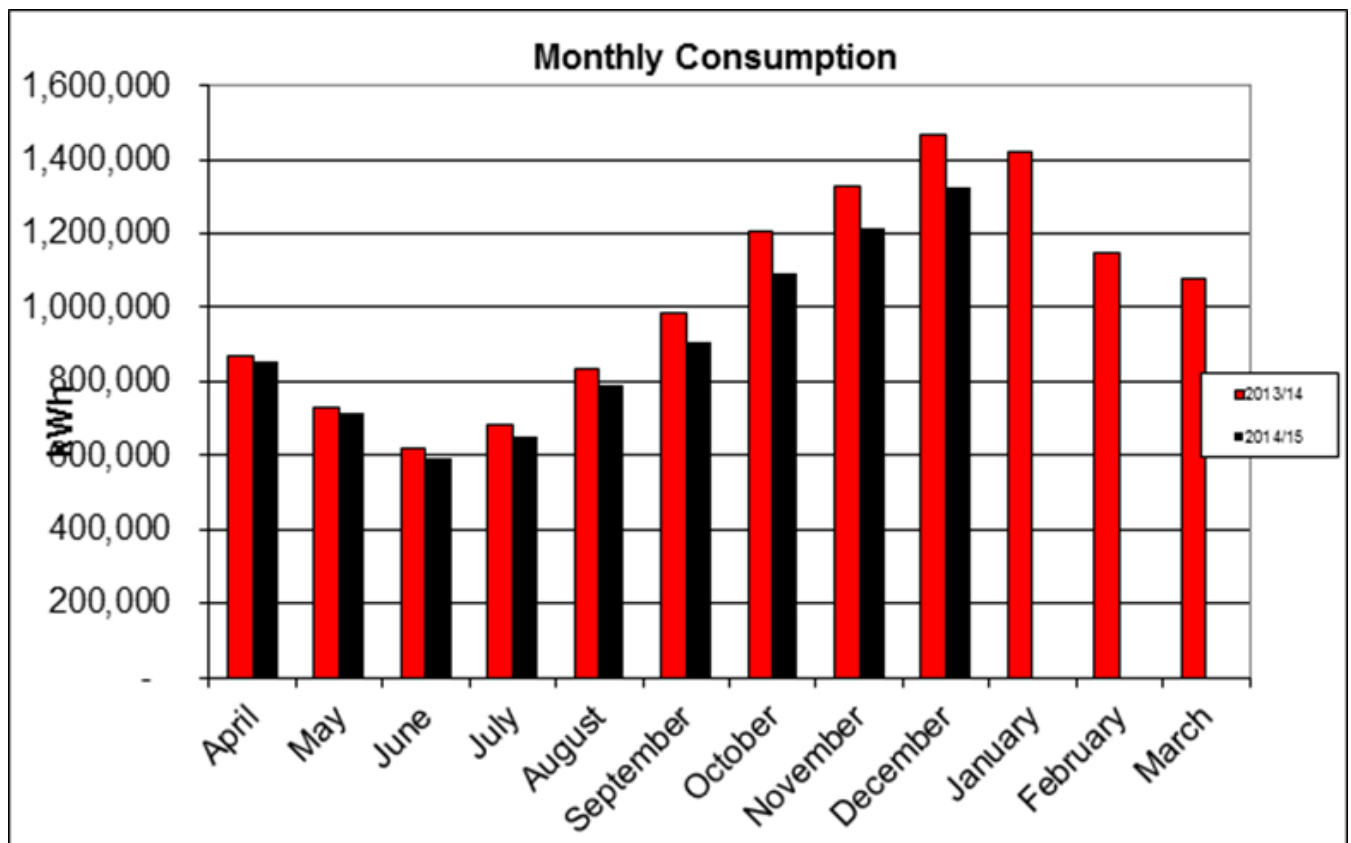


Figure 1: Energy consumption in kWh as installation progressed in 2014/15 compared to previous year.

OTHER OPTIONS CONSIDERED

5.1 None

This report has been approved by the following officers:

Legal officer Financial officer Human Resources officer Estates/Property officer Service Director(s) Other(s)	
For more information contact: Background papers: List of appendices:	David Bartram 01332 641516david.bartram@derby.gov.uk None Appendix 1 – Implications

IMPLICATIONS

Financial and Value for Money

1.1 None from this update report but this project is delivering savings to the authority.

Legal

2.1 None

Personnel

3.1 None

IT

4.1 None

Equalities Impact

5.1 None

Health and Safety

6.1 None

Environmental Sustainability

7.1 Positive - By completing the works identified in the recommendations there will be a reduction in energy that will increase the council's ability to meet its sustainability targets for CO₂ reduction.

Property and Asset Management

8.1 None

Risk Management

9.1 None

Corporate objectives and priorities for change

10.1 None