

WIRRAL COUNCIL

CABINET – 23 JULY 2009

REPORT OF THE DIRECTOR OF TECHNICAL SERVICES

ENERGY SAVING INITIATIVE – INVEST TO SAVE ELECTRICITY METERING FOR STREET LIGHTING BY THE INTRODUCTION OF A CENTRAL MANAGEMENT SYSTEM

1.0 EXECUTIVE SUMMARY

- 1.1 Cabinet will be aware of the need to reduce the Council's energy consumption. A Central Management System (CMS) for street lighting would provide the means to control the operation of streetlights connected to the system and to have the energy consumption of that street lighting accurately measured. This in turn would facilitate immediate financial benefits for any energy saving measures implemented.
- 1.2 This report requests approval for a trial installation of a Central Management System controlling approximately 350 streetlights.

2.0 BACKGROUND

- 2.1 The vast majority of electricity consumption by street lighting in UK is un-metered. The payments made by Councils for electricity are based upon agreed hours of use plus the notional power demands of various lamps and control gear combinations laid down in the Balancing and Settlement Code BSCP520 by Elexon. Elexon is the company that administers the complicated business of settling the payments for wholesale electricity in the UK.
- 2.2 Any equipment intended for connection to an un-metered supply has to be assessed and given an energy rating by Elexon. This system is inflexible and in most instances the full potential of any energy saving measures implemented are not recognised and therefore do not result in lower energy bills.
- 2.3 Until this year the only means of being certain of achieving financial savings from reduced energy consumption was to have a conventional electricity meter installed. This was expensive and, in most cases, impractical.
- 2.4 On January 6th 2009 Elexon gave the first approvals for the use of Central Management Systems recognising the energy usage data provided as a means of metering.
- 2.5 A Central Management System gives the user two-way communication with every lighting unit that is suitably equipped and enabled to respond. The user can instruct the light when to turn on, when to dim and when to turn off. The lighting unit can send information back detailing the energy usage, lamp performance, fault identification and fault prediction.
- 2.6 Most Central Management Systems are web hosted and the user can log on from any pc with internet access. A web-based system may be designed to interface with a computer based asset management system. Communication between the Central Management System and the area control points is by telecoms landline or mobile broadband.
- 2.7 There are two communication methods between area control points and the lighting units:
 - 1) mains cable transmission from the lighting unit to a local control point

- 2) low power radio transmission from the lighting unit to a local control point

Mains cable transmission is probably best suited to areas where a dedicated streetlighting electricity cable network is in existence. In Wirral most streetlights are connected to Scottish Power's mains network and agreement would have to be reached with Scottish Power before their network could be used for data transmission. Low power radio transmission removes the need for consent from other parties

2.8 There is no communication standard for Central Management Systems as yet hence consideration must be given to compatibility between the control gear in the lighting units and the components of the Central Management System.

2.9 The introduction of these systems is still at an early stage throughout the UK and the largest installation to date controls 1300 units.

3.0 OPERATIONAL BENEFITS

3.1 The introduction of a Central Management System would allow the remote, dynamic control of street lights connected to the system. It would be possible to switch lights on and off when required and lights with dimming capability could be brightened or dimmed as and when required. The system could be arranged so that the level of lighting was appropriate to requirements at any given time. For example, increased lighting in the vicinity of a theatre for a period when the audience was due to leave but lower levels on nights when there was no performance.

3.2 Most importantly, the system could be used to measure the amount of electricity used thereby ensuring that the implementation of energy saving measures would result in immediate cost benefits.

3.3 The dynamic control of lights would allow dusk & dawn switching times to be adjusted and trimmed to shorten the burning hours to the minimum required. In conjunction with dimming this would reduce energy consumption and extend the life of the lamp. The Central Management System will not be used to turn any lights off during the hours of darkness

3.4 The system would eliminate the problem of lights burning during the day due to photocell failure.

3.5 Night inspection of lights controlled by a Central Management System would no longer be required as faulty lights would be reported through the system.

3.6 By studying the lamp performance data the system would be able to predict lamp failures. This would facilitate management of lamp replacements particularly on high speed roads where traffic management is required.

4.0 PROPOSAL

4.1 It is not necessary to bring all of the lighting stock immediately under the control of a Central Management System, indeed out of a total of 37,750 lights only 9,500 lighting units are suitable. Initially, a Central Management System could be connected to a small proportion of the lighting stock.

4.2 In order to verify that the claimed benefits can be realised it is proposed that a small scale trial is carried out involving up to 1% of the total lighting stock.

4.3 A number of existing lighting units will be fitted with dimmable electronic control gear and enabled for connection to the Central Management System.

- 4.4 Initially, the system would be used to operate the dimming and switching facilities available. Members, local residents, and other stakeholders would have the opportunity to comment on the performance of the installations.
- 4.5 Members are aware of the option to dim streetlights referred to in the report to Cabinet on 9th July 2008. The Central Management System is a further advance of the technology involved and dimming will form part of the trial proposed in this report superceding the original proposal.
- 4.6 The results of this trial will be reported to Cabinet before the end of the current financial year.
- 4.7 This trial supports the previous investment for energy saving measures that are in progress. The transition period leading to the start of the HESPE contract introduced a delay but the works are on target for completion this financial year.
- 4.8 Given satisfactory results, the next stage would be to make the necessary arrangements for energy costs of connected lights to be paid for based upon the readings recorded by the system.
- 4.9 Subsequently, the specification for any new lighting installations would incorporate the necessary control gear and communications module
- 4.10 It will not be possible to connect the old style orange low pressure sodium sox lighting units to CMS hence, the rate at which the network of lights under the control of CMS increases will depend upon the funding available to renew the street lighting stock

5.0 FINANCIAL AND STAFFING IMPLICATIONS

- 5.1 There are no staffing implications arising from this report.
- 5.2 The investment of the £137,000 saving identified in the earlier report to this Cabinet meeting would meet the cost of setting up a trial system controlling approximately 350 streetlights. The aim of the trial would allow me to positively identify and evaluate the potential benefits of such a system particularly in relation to:
- Energy savings and eradication of “day burners”
 - Impact/savings associated with carbon reduction/carbon credits
 - Scrutiny and Inspection costs

and in particular if successful how best to “roll-out” the system to the existing 9500 suitable units and potentially increasing this number.

- 5.3 The annual operating cost of this installation would be in the region of £700.
- 5.4 System manufacturers claim energy savings of 40% can be achieved. Current street lighting energy costs for Council are in the region of £1.5m.

6.0 EQUAL OPPORTUNITIES IMPLICATIONS

- 6.1 It is recognised that dimming of lights will need careful consideration so as not to disadvantage the various groups who require good levels of lighting on health and safety grounds. However, the dynamic control offered by a CMS would allow easy adjustments to be made to accommodate any special requirements.

7.0 PLANNING IMPLICATIONS

- 7.1 There are no planning implications in this report.

8.0 COMMUNITY SAFETY IMPLICATIONS

8.1 There are no crime and disorder strategy implications in this report.

9.0 HUMAN RIGHTS IMPLICATIONS

9.1 There are no local Human Rights implications arising from this report.

10.0 ANTI - POVERTY IMPLICATIONS

10.1 There are no local Anti-Poverty implications arising from this report.

11.0 LOCAL AGENDA 21 IMPLICATIONS

11.1 By ensuring that lights are operating at maximum efficiency and that light levels are maintained at the lowest appropriate to the situation and pedestrian/traffic flows, CO2 emissions will be minimised and the carbon footprint reduced.

11.2 Removing the need for night inspections and using the predictive facilities of the system will reduce the vehicle usage bringing about a reduction in vehicle emissions as a result.

12.0 SOCIAL INCLUSION IMPLICATIONS

12.1 There are no Social Inclusion implications arising from this report.

13.0 ACCESS TO INFORMATION ACT IMPLICATIONS

13.1 There are no Access to Information Act implications arising from this report.

14.0 LOCAL MEMBER SUPPORT IMPLICATIONS

14.1 There are local Member implications for all Wards in which trial sites will be located.

15.0 RECOMMENDATIONS

15.1 That members approve the proposal for the trial to be carried out using the £137,000 saving identified in the earlier report to this Cabinet meeting as the source of funding.

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