
Meeting: Corporate Services Overview and Scrutiny Committee

Date: 16th December 2014

Subject: The Council's approach to energy efficiency across the corporate and schools estate.

Report of: Cllr Maurice Jones, Executive Member for Corporate Resources.

Summary: This report provides further information on the Council's approach to energy efficiency across the corporate and school estate in response to a request from Corporate Resources Overview & Scrutiny Committee on the 21st October 2014. In 2013/14 the energy bill for the Corporate estate was £1.7m and schools paid a combined £3.2m. Since 2009/10 energy efficiency work has led to savings of £682k in the Corporate estate and £1.9m for Schools. Due to the predicted impact of increasing energy costs and Energy Market Reform (EMR), by 2020/21, without a continued proactive approach to energy efficiency, the annual energy cost for the corporate estate is predicted to be £3m with the schools estate facing a combined energy bill of £5.4m.

Advising Officer: Deb Broadbent-Clarke, Director of Improvement and Corporate Services

Contact Officer: Ben Finlayson, Head of Capital Projects
Stephen Mooring, Environmental Policy Manager

Public/Exempt: Public

Wards Affected: All

Function of: Executive

CORPORATE IMPLICATIONS

Council Priorities:

Taking positive and proactive steps to tackle climate change demonstrates leadership and contributes to the delivery of all the Council's priorities, particularly in relation to Value for money – freezing council tax.

Financial:

1. The 2013/14 annual expenditure on Energy by the Council was £1.7m (excluding schools). As set out in this report, the cost of Energy is increasing annually at a rate higher than inflation leading to additional pressure on the revenue budget each year. Therefore, any ability to reduce Energy use or deliver cheaper alternatives reduces this budget pressure and any savings allow the Council to divert its resources to other areas, delivering better value for money for residents.
2. Work undertaken to date to improve Energy Efficiency has seen energy expenditure reduce at a time when the cost of energy has continued to increase. Without any work in previous years to reduce energy consumption, the 2013/14 Corporate Energy bill would have been in the region of £2m.

Legal:

3. The Climate Change Act (2008) commits the UK to meeting targets for Carbon Emission reductions. These will be delivered through a range of mechanisms which include interventions to drive forward energy efficiency and decarbonisation of the grid through the use of Renewables.
4. The Energy Act (2013) adds further detail to this and brings forward mechanisms to reduce peak electricity demand, incentivise renewable energy generation and modernise energy generation and transmission infrastructure through Energy Market Reform (EMR). Although many of these measures are not direct legal requirements on the Council, they do drive how energy efficiency is addressed. The Energy Performance of Buildings Directive will be enacted into UK law during the next parliament, placing a legal requirement for new public buildings to be near or zero carbon by 2018, and all other buildings zero by 2020. It is not yet clear how the UK government will choose to implement these requirements.

Risk Management:

5. Taking a proactive approach to energy efficiency minimises financial risk and enhances the control of expenditure at a time when energy prices are predicted to continue to increase into the medium term.

Staffing (including Trades Unions):

6. Not Applicable

Equalities/Human Rights:

7. There are no implications for equality or human rights.

Public Health

8. This will not have any implication on public health and wellbeing in the area.

Community Safety:

9. Not Applicable

Sustainability:

10. The proactive approach to energy efficiency being taken by the Council links strongly to key principles of sustainability which are; living within environmental limits, ensuring a strong, healthy and just society, and achieving a sustainable economy. The Council's Climate Change Strategy and Carbon Management Plan are based around the delivery of energy efficiency measures as a way to not only cut operational costs but to also reduce the Council's carbon footprint and contribute to mitigation of climate change.

Procurement:

11. A paper setting out how the Council procures energy was considered by this committee on the 21st October 2014. Whilst this plays an important role in controlling costs, ultimately the most effective approach is to use energy more efficiently, meaning that less has to be procured in the first instance.

RECOMMENDATION(S):

The Committee is asked to:-

- 1) Review the Council's approach to energy efficiency across the corporate and schools estate and comment on any specific aspects they consider to be appropriate in relation to the delivery of this work moving forward into 2015/16 and 2016/17.
- 2) Champion the good progress made to date and support the need for continued action in relation to energy efficiency across the corporate and schools estate, especially in relation to the likely future financial consequences of not adequately progressing this area of work.

Introduction – setting the context for action

12. The Council's annual energy bill for its corporate estate for 2013/14 (including street lighting but excluding schools) was £1.7m. The implementation of energy efficiency and other measures (such as YourSpace2) has contributed to reduced energy consumption of approximately 11% compared to 2009/10. In the same period the cost of energy has increased by around 5% per annum nationally. If energy consumption had continued at 2009/10 levels, the Council could have faced an energy bill of £2m in 2013/14. This demonstrates a saving of £294k in 2013/14 and an overall saving of £682k since 2009/10.
13. Between 2009/10 to 2013/14 the schools estate has seen a reduction in actual energy consumption of 23.5%. The combined annual energy bill for 2013/14 was £3.2 million, with the bill for a typical lower school in Central Bedfordshire being £13k, a typical middle school paying £40k and a typical upper school £110k. Without the energy efficiency support the Council provides, and taking into account the impact of increasing energy costs, the combined annual energy bill for schools could have been in region of £4.2m in 2013/14. This demonstrates a saving of £1m in 2013/14 and an overall saving of £1.9m since 2009/10.
14. If the lower end estimate from the Department of Energy & Climate Change (DECC) energy price projections of 5.3% per year is applied, then by 2020/21, without continued energy efficiency action, the Council could be facing an energy bill for its corporate estate of £2.4m (an increase of £0.7m). Schools will see an increase in their combined energy bill of £1.4m, to just over £.6m.
15. In addition to the impact of increasing energy prices, 2016 will see the introduction of Energy Market Reform (EMR) which will see an additional charge applied to all electricity bills for the purpose of funding investment in new energy generation and transmission infrastructure. It is estimated that this could add an additional 20% to electricity bills, with this increasing to 50% from 2020/21. This would see the corporate energy bill (including street lighting) increase by a further 0.4m to £2.8m by 2019/20 and to £3m in 2020/21. The combined schools energy bill would increase by a further £0.5m to £5.1m by 2019/20 and £5.4m in 2020/21. This represents a 70% increase in the price of energy by 2020/21 compared to 2013/14.
16. Taking the impact of increasing energy costs and EMR in to account, this would mean that by 2020/21, without a proactive approach to energy efficiency in schools, the annual energy bill for a typical lower school in Central Bedfordshire is expected to be £22k, with a typical middle school paying £67k and a typical upper school £185k.

17. Alongside the financial impacts, the Council's Climate Change Strategy has set a target of reducing the carbon footprint of the council by 35% by 2015, working towards an overall 60% reduction by 2020 (from a 2009/10 baseline). Progress so far has seen a reduction in the Council's carbon footprint of 17% from last year and just under 24% from the 2009/10 baseline. When this is converted to the equivalent energy consumption – as shown in graph 1 in Appendix A, the Council is likely to have to hit these targets just to keep energy costs close to current levels and prevent additional financial pressures.
18. Alongside reducing energy consumption, another way of limiting the impact of increasing energy costs is by maximising opportunities for the Council to generate its own electricity through the deployment of Renewable energy generation systems, such as Solar Photovoltaic (PV) Panels. This not only reduces the consumption of energy from the grid, as a proportion is generated on site, it is also eligible for additional government incentive payments, such as the Feed-in-tariff (FIT).

Energy Efficiency in the Corporate Estate – Overview

19. The Council has an annual rolling capital budget of £300K, managed by the Capital Projects Team within Assets, assigned to the delivery of carbon reduction and energy efficiency measures. This budget increases to £400K in 2016/17 and is currently planned to continue until 2018/19, however, as discussed below work is currently underway to produce a strategy for the delivery of Energy Reduction across the corporate estate which may impact this budget profile. Alongside this specific budget, when undertaking any work on the corporate estate, energy efficiency is considered in the specification of any replacement or upgrade of equipment and building fabric items.
20. In the 2013/14 financial year a number of schemes were delivered utilising the carbon reduction budget, each of which focussed on reducing the revenue impact of energy bills on the corporate estate. This included major schemes such as Boiler and controls replacement at the Townsend Centre in Dunstable, installation of Thermostatic Radiator Valves on every radiator at Watling House Offices, a number of lighting replacement schemes at various properties and 3 large solar energy schemes at Bossard House (Leighton Buzzard), Priory House offices and Sandy Library.
21. Smaller schemes such as insulation improvements, Voltage Optimisation and the addition of energy efficient hand driers at some sites were also delivered, each of which contribute to the reduction in energy use across the estate. The team also rolled out the installation of Automated Meter Reading (AMR) at a number of sites allowing energy use to be tracked on a half hourly basis. This has led to a number of changes being made to Building Management Systems (BMS) where inefficiencies have been identified and has also allowed behavioural changes to be identified and rolled out with the aim of reducing energy consumption.

22. This financial year (2014/15), a proportion of the carbon reduction budget is being utilised to undertake detailed energy efficiency audits of 27 corporate buildings including offices, libraries and leisure centres. The information resulting from these audits, which will include investment grade proposals for recommended energy efficiency improvement measures, is being produced by WYG and will feed in to a report to CMT at the end of the financial year, seeking approval of a strategy for investment in energy efficiency going forward. The purpose of the reports is to identify those investment opportunities that have an acceptable payback period to allow the team to prioritise these and bid for any additional funds required to deliver them. Phase 1 of the programme has now been completed which covers 9 properties including; Priory House, Watling House and Saxon Pool. A number of measures have been identified at each site ranging from zero cost adjustments to significant capital schemes to improve energy efficiency and therefore reduce running costs for the Authority.
23. The remaining budget in 2014/15 is being utilised to undertake any projects identified by the surveys that can be delivered prior to year end such as LED lighting of Priory House car park which makes revenue savings in both energy and maintenance costs. A number of other schemes are also planned for delivery this year including work to the BMS at Priory House and the installation of Solar Panels at Flitwick Library.
24. The resulting recommendations from the full suite of WYG Energy audits will include detail of the financial returns, both in terms of reduced energy costs and any income in the case of generation schemes, associated with each of the proposed improvements, allowing a decision on the delivery of each scheme to be made on a cost benefit basis. Once all of the audits have been completed, the information will be collated and a strategy for the delivery of those schemes deemed to deliver suitable return on investment and improvements to the Authority's Carbon Footprint will be produced. This strategy will also consider work planned to be undertaken as part of the associated Corporate Rolling Programme capital budget which funds significant maintenance and improvement works at corporate sites and the general revenue maintenance budgets associated with each site.
25. Any site that has work identified under either of these budgets will be checked to see if works can be combined or adjusted to take account of the carbon reduction proposals. This will ensure a considered and value for money approach to the delivery of the proposed work. Also, the strategy will consider the estate as a whole in terms of the delivery model. For example if a number of sites are identified as benefitting from the same type of improvement this could be tendered as a package of work which would offer economy of scale benefits. The capital cost of delivering the improvements will not be known until the results of the Audits have been analysed, however any increase in budget will be requested through the Outline and Detailed Business Case process with full justification.
26. Examples of Energy Efficiency and Generation schemes delivered on Corporate sites is provided in Appendix 2.

Supporting Energy Efficiency in Schools - Overview

27. Energy use within the school estate makes up 51% of the council's carbon footprint. The council does not pay school energy bills directly, instead maintained schools are allocated a budget from which their energy bills must be paid. Academies receive funding direct from the Department of Education from which energy bills must be paid. In both cases individual schools are responsible for managing their own budgets. Reducing the energy use attributed to schools represents a significant challenge given:
 - a. the number of individual schools to work with (135);
 - b. on-going budget constraints being faced across the whole public sector;
 - c. the challenging nature of the schools estate (e.g. the age and structure of buildings), and;
 - d. the changes to how schools are organised, managed and funded – particularly in relation to Academies.
28. Motivation for reducing school energy bills comes from the need to divert more funding towards educational resources and staff, and away from utilities. This also mitigates against the impact of utility price increases. Since 2012 the Council has had a dedicated School's Energy Officer in post, funded by the Schools Forum to support schools to reduce energy use. Due to the number of schools and relative autonomy over their energy management, a large part of this role is about engagement, training and awareness raising to empower schools to take control of their energy use with a view to delivering efficiencies. An annual budget of £100k has been set up by the Schools Forum to support maintained schools to invest in energy efficiency and generation technologies on an invest-to-save basis.
29. From April 2013 to date, 42 schools have actively engaged with the Schools Carbon Reduction Action Plan (SCRAP) program leading to a total financial saving within the school estate of £265k in 2013/14 compared to the previous year. This represents an average saving of over £6k in each of the schools engaged in the SCRAP program. This has been achieved primarily through the use of smart metering and the associated efficiency actions that result. Over 55% of the school estate now have smart meters installed with an ongoing installation plan in place. In May 2014 the annual Energy Efficiency awareness event was held, attended by over 70 school representatives. Feedback was overwhelmingly positive, clearly demonstrating that the schools are responding well to the support being offered.
30. Phase two of the SCRAP, which focuses on energy efficiency, was launched in May 2013 and saw the introduction of a more formalised engagement structure with schools. Participating schools now receive a site visit from the Schools Energy Officer that incorporates an energy audit and on-going one to one support specific to that school. The Energy Officer then works with the school to draw up an action plan with achievable goals for reducing energy use. This places an emphasis on the school taking ownership of the action plan with responsibility for completing the actions resting primarily with the school.

31. All action plans are proactively followed-up. This ensures actions are reviewed, next steps identified and a better understanding is gained of any barriers that are stalling progress. The site visit is also used as the primary way of engaging schools in the other energy services offered by the council, such as the Invest-to-Save scheme and Automated Meter Reading equipment. Schools have also started to take advantage of wider range of complimentary services provided by the Energy Officer including student workshops and eco school accreditation, both of which support the work being undertaken through the action plan.

32. **Supporting Renewable Energy Generation in Schools**

The most appropriate form of onsite energy generation within schools is Solar PV. This view is supported by Central Government and Third Sector organisations. Schools are particularly suited to Solar PV as they are in use during daylight hours, enabling them to utilise the energy generated by a solar PV system. They often have flat roofs, allowing for straightforward install and are usually not shaded by other buildings.

33. Schools benefit financially from Solar PV in three ways. Firstly the power generated by the panels reduces the power drawn from the grid, significantly reducing a school's energy bill. Secondly for every unit of energy produced by system the UK government will pay the school at a certain rate for 20 years through the Feed in tariff scheme (known as FiT's). Thirdly any power generated that the school is unable to use, such as during holiday periods, is sold back to the grid.

34. An extensive procurement exercise has recently been undertaken to acquire a purchasing framework for Solar Power installers (Photo Voltaic). The framework will be used to deliver Solar Power schemes through the Invest to Save fund to viable school sites as well as utilising it for corporate schemes. Three schools are signed up for this year which will utilise the budget allocation and two are signed up for next year with interest growing all the time.

35. Examples of Energy Efficiency and Generation schemes delivered at Schools are provided in Appendix 3.

Conclusion and Next Steps

36. As set out in the background information, the Authority spent around £1.8m on energy in 2013/14. This spend, the increasing costs of energy and work undertaken to date have demonstrated significant scope to reduce the revenue costs of the Council. Energy efficiency should be considered in all capital projects to ensure that the best materials and technologies are being used whilst also being mindful of cost and resulting payback. In this first round of Energy Audits the Authority has targeted 27 of its buildings, there is still a significant proportion of the estate that is yet to be reviewed and should be considered going forward.

37. The school estate spends more than £3m per year on energy. Any budget spent on energy cannot be directed towards educational resources. Funding is always challenging for schools, but by taking greater control over their energy use and therefore spending, schools can protect themselves against the impact of increasing energy costs.

38. Many of the schools in Central Bedfordshire have yet to engage with the SCRAP program and not all that have Smart Meter (AMR) technology are using it to best effect. Through the School's Energy Officer, the Council has reached a good level of engagement on this issue with schools, which has the potential to grow rapidly and to ensure the good work to date is built on in light of future challenges. Over the next year activity will include:
- a. Following analysis of the annual Green House Gas report data, the 20 schools with the greatest efficiency opportunities have been identified. These schools will form the primary focus of the SCRAP delivery plan with a view to engaging and facilitating these schools towards delivering efficiencies such as we have seen elsewhere in the school estate.
 - b. An installation plan to ensure maximum coverage of Smart Meters (AMR) within the school estate, will aim for 70% coverage by the end of the 2014/15. This will be supported by an ongoing training program to ensure that schools can take ownership and use their data effectively to drive out inefficiencies.
 - c. To encourage energy efficient behaviour, the BluEffect behaviour change tool will be promoted to schools. The tool is designed to link with the curriculum and encourage staff and students to make sustainable behaviour choices at home and in school.

Appendices:

Appendix 1: Graph showing progress to date and future energy cost projections for the Council's Corporate Estate (2009/10 to 2020/21)

Appendix 2: Case studies of energy efficiency and generation projects undertaken on the Corporate estate.

Appendix 3: Case studies of energy efficiency and generation projects undertaken with Schools.

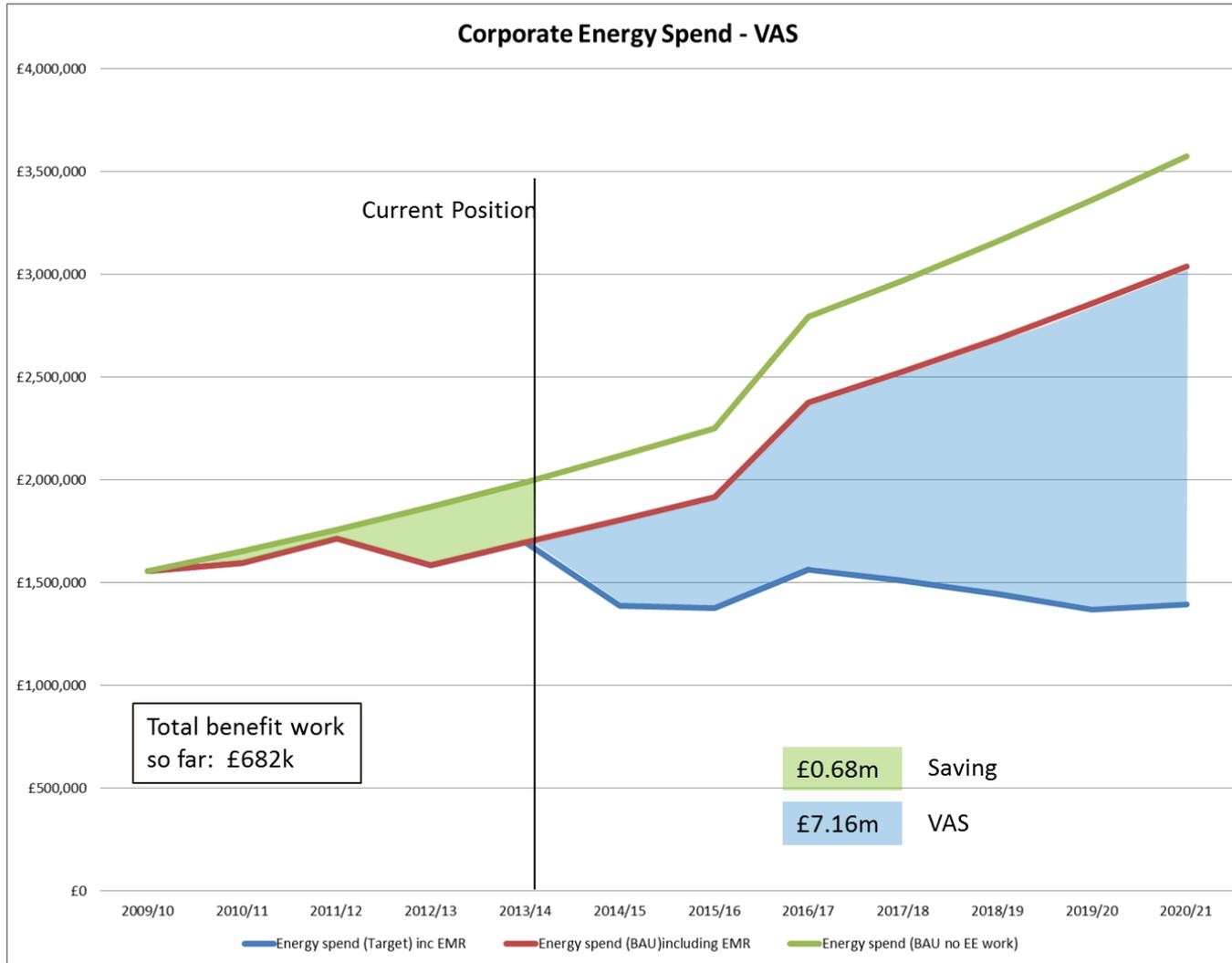
Background Papers: (open to public inspection)

Climate Change Strategy and Carbon Management Plan

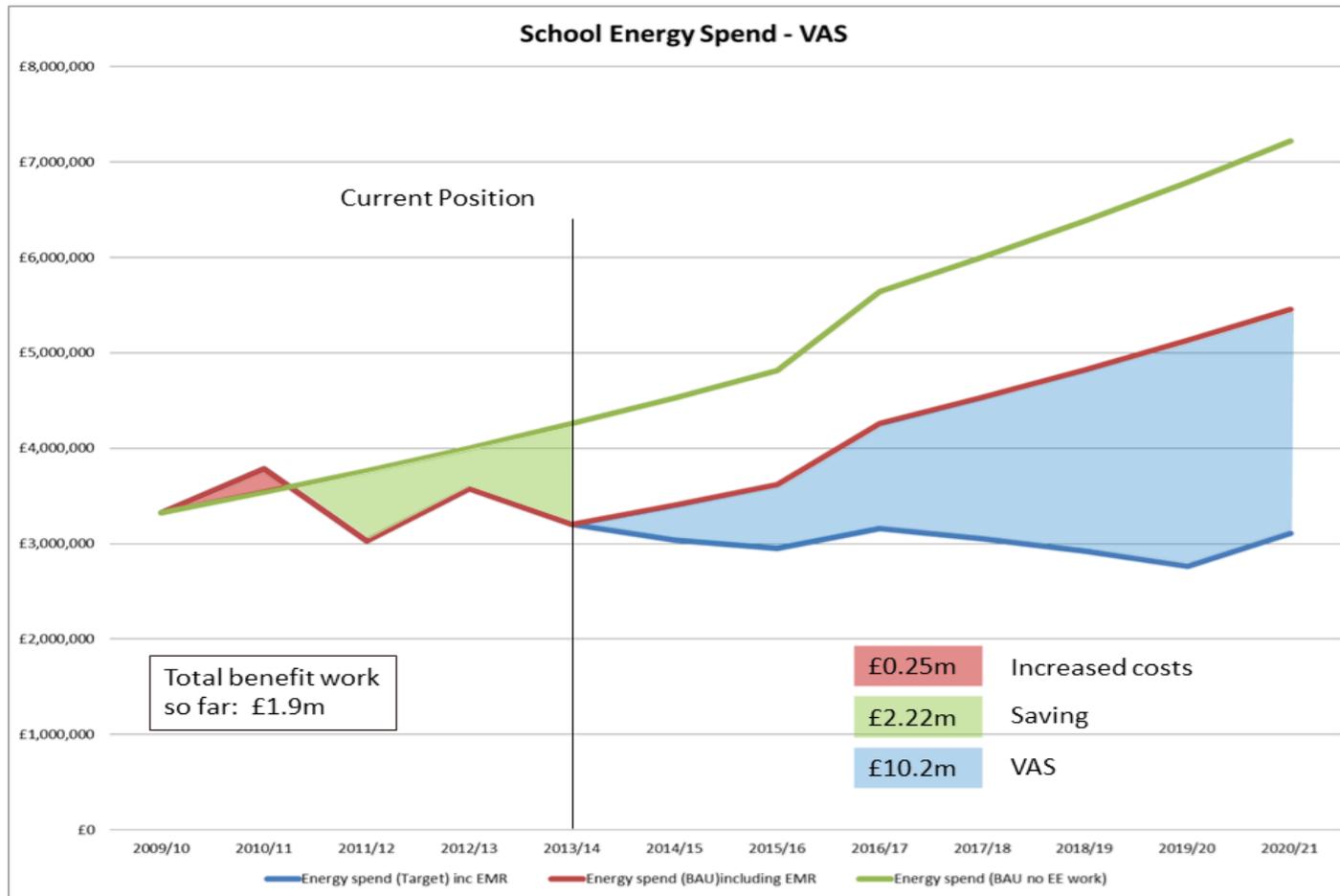
Both documents available from:

<http://www.centralbedfordshire.gov.uk/environment/natural-environment/climate-change-sustainability.aspx>

Graph 1 - Progress to date and future energy cost projections for the Council's corporate estate (2009/10 to 2020/21)



Graph 2 - Progress to date and future energy cost projections for the Council's Corporate Estate (2009/10 to 2020/21)



Energy Efficiency in the Corporate Estate - Example

Energy efficiency work includes measures that seek to reduce the amount of energy that the Authority uses. It does not include the replacement of sources of energy which is covered by the generation section below.

Watling House Thermostatic Radiator Valve installation:

In November 2013, all of the radiators at Watling house (387) were adapted to include Thermostatic Radiator Valves (TRV's). These valves, which are standard equipment on all new heating installations, automatically shut off the radiator once the ambient temperature reaches a set point. In doing this, if the heating is in operation, a radiator can shut itself off and reduce energy consumption if the area it is located in has reached the optimum temperature. As well as reducing costs, this process also provides a more stable and comfortable working environment with temperatures remaining at the programmed set point rather than remaining on and allowing areas to become too hot. This has addressed the issues of solar gain experienced in the building where the sunny side of the building gets too hot and the shaded side too cold.

Energy Generation in the Corporate Estate - Example

Energy Generation is also a key part of the work required to reduce the costs of Energy to the Authority but rather than reducing energy usage generation replaces conventional (expensive) sources of energy with alternative, generally greener sources such as wind and solar.

Priory House Solar Scheme:

In October 2013, 50Kw of Solar Photo Voltaic panels were installed on the roof of Priory House. From the 1st April to 22nd October this year the system generated 40,231KWh of electricity which has directly offset electricity provided from the grid and of course the associated cost of this. Due to the large amount of IT equipment etc. Priory House has a significant base electricity load which makes it ideal for a Solar scheme as the site utilises all energy produced by the panels at all times leading to maximum efficiency and financial benefit (compared to exporting at a lower rate).

As well as the reduction in electricity costs, the Authority is guaranteed index linked Feed in Tariff (FiT) generation payments for every KWh of electricity generated by the system until 2034. The scheme is subsequently predicted to pay for itself within 6 years (from the date of installation). However, the system is currently exceeding generation expectations, having generated nearly 90% of its expected annual levels over the last 8 months. In light of this the payback period could be reduced.

Supporting Energy Efficiency in Schools - Example

Caddington Village School – Combined Efficiency Project

With support from the council's Energy Officer, Caddington Village School has made significant savings on both their gas and electricity bills by taking a range of complimentary actions. This has resulted in a reduction to their annual energy bill of £12k when compared to the previous year.

Much of this has been achieved through proactive use of the Smart Meter technology installed by the council and support from the Schools Energy Officer. Wastage and efficiencies were identified in the data, and by working with key stakeholders at the school, potential solutions were identified. By adjusting opening times and ensuring the boilers are on much stricter timing and temperature controls, alongside a dedicated switch-off campaign the school has seen a reduction in energy use of over 30%. This has been maintained through ongoing monitoring of energy data and KPI's being set.

This, along with new windows and doors and the future replacement of 80% of the roof and the single skinned roof lights will result in a further sizeable reduction on gas and electricity usage going forward.

The school have also installed energy efficient T5 and LED lighting to the newly refurbished areas alongside movement sensors to control the lighting, thermostatic controls to radiators and the pupils have made their own "Hippos" to reduce water consumption from toilets.

The pupils have been eager participants in making the school more environmentally friendly, and as a result the school recently achieved Green Flag status against the national Eco School award scheme.

Supporting Energy Generation in Schools

Leedon Lower School – Solar PV installation

Leedon Lower School have completed a project to install a 50kW peak solar PV system onto their flat roofs as part of the Invest to Save scheme run through the Schools Carbon Reduction Action Plan (SCRAP)

The solar array is calculated to provide the school with up to 50% of the electricity requirement. This should see a dramatic reduction in utility bills over time, allowing for greater spend on educational services. Furthermore the school will be producing its own clean energy and the children will learn about energy issues through the information produced by the solar panel information display to be installed in the school foyer.

We chose Leedon Lower to pilot the solar PV 'Invest to Save' scheme as they have shown great interest and enthusiasm for the scheme and have the full backing of the Governors and Leadership team. The layout of the school's flat roofs allow for an easy installation and furthermore, the school is not connected to the gas grid and so uses a lot of electric powered heating, meaning that the school has a high electricity bill that CBC would like to help the school reduce.