Hampshire Fire and Rescue Authority

Finance and General Purposes Committee **Item 8**

29 July 2011

Reducing energy costs and our impact on the environment : progress report

Report by the Chief Officer

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1 Summary

1.1 Escalating energy and fuel prices will have considerable financial burdens unless we invest in energy reduction projects in the short-term. That was one of the main justifications for the Authority committing to Carbon Trust's 'Carbon Management Programme'. Good progress is being made in developing a number of positive actions over the next six months. Some energy saving projects at the Headquarters site are described here for early consideration for funding. An update is provided on the progress of the Environmental Champions. Also, an outline of the case for the potential future investment in Solar Photovoltaic (Solar PV) installations – with the benefit of 'feed-in tariffs' – is described.

2 Recommendations

2.1 That approval be given for improvements to be made to the heating and hot water systems at Headquarters as set out in paragraphs 7.3 and 7.4 of this report and that these 'invest to save' works be funded from the Authority's Improvement and Sustainability reserve.

2.2 That work on the development of a business case for Solar Photovoltaic installations on major buildings continue so that the Authority has robust financial information on which it can base any future investment decisions.

2.3 That to demonstrate our determination to reduce the Service's carbon footprint, an appropriate 'statement of commitment' to the Public Sector Carbon Management Programme be produced and jointly signed by the Chairman of the Authority and the Chief Officer at the Authority's next meeting (September 2011).

3 Introduction and background

3.1 This report provides a progress update on some significant environmental work since the 14 January 2011 report to the committee "Reducing our impact on the environment : progress report".

3.2 There has been some significant progress on a partnership approach to adaptation to climate change work which is described in the following section. Section 5 covers the launch of the Hampshire-wide Climate Change Partnership and its implications for future climate change mitigation (carbon saving) projects. The initial progress on the Service's work with the Carbon Trust on developing plans for cutting our carbon footprint are described in section 6, followed by information on some heating and electricity saving projects for the Headquarters building. Section 7 describes the setup of a 'quick wins' fund for fire stations and the good start made by the Service's Environmental Champions. Section 9 provides an indication of the opportunities for investment in Solar PV on Service buildings.

3.3 Significant progress has been made towards the Service fulfilling its Nottingham Declaration commitments.

4 Adaptation to climate change

4.1 This is about making planned changes to our buildings and operations to allow us to be better prepared for the climatic changes predicted for Hampshire.

4.2 The Service has completed a risk based assessment of vulnerabilities to weather and climate both now and in the future. This was done using a tool developed by Hampshire County Council.

4.3 The Director of Service Delivery has asked the Hampshire and Isle of Wight Local Resilience Forum (LRF) to facilitate collaborative work on adaptation to climate change. One of the outcomes is agreement on a proposal for a workshop to share learning and best practice on climate adaptation work by all the LRF organisations. This workshop (hosted by Hampshire County Council) will facilitate closer working between key partners.

4.4 The Service's risk-based assessments for climate change adaptation and the developments in local partnership work through the LRF help fulfil commitments made when the Authority signed the Nottingham Declaration on Climate Change.

5 Hampshire-wide Climate Change Partnership

5.1 The last environment report mentioned the development of a long-term partnership of organisations across Hampshire to help address climate change. This sought a shared vision - interim name 'Hampshire-wide Climate Change Vision and Strategy'. At a meeting on the 9 December 2010 the partnership agreed the vision statement.

5.2 The Chief Officer signed the partnership on behalf of the Service and supported the proposal to create an independent legal entity to manage the priorities of: 'Solar PV', 'Energy Efficiency in Public Buildings', and 'Domestic Retrofit'.

5.3 However, there was less support than had been anticipated for the creation of a independent legal entity and formal collaborative actions between partners. So, the partner organisations are now separately pursuing priorities such as installation of

Solar PV and improved energy efficiency in public buildings. There may still be opportunities to work with partner organisations on some of these projects through collaborative procurement frameworks. We hope that, in the future, the Hampshire-wide partnership will develop and begin to deliver more collaborative projects.

6 Carbon Trust Public Sector Carbon Management Programme

6.1 We have implemented the Authority's decision to join the Carbon Trust's Local Authority Carbon Management Programme for 2011-2012. In May 2011 we began working with the Trust on the 'Public Sector Carbon Management Programme' (PSCM) – this is the new name for the Programme.

6.2 Involvement in the PSCM programme is being overseen by the Service's Directors (as a Programme Board). The Director of Corporate Services is the Project Sponsor and the Environmental Impact Project Coordinator is the Project Lead. Staff in key roles across the service have been identified to assist in identifying and delivering on carbon saving projects. These staff comprise the Project Team.

6.3 The Service's 2010-2011 baseline carbon footprint for the PSCM will be established shortly. In support of the corporate objective "We will use energy more efficiently at our buildings" the new baseline will include sources such as domestic water use and fuel oil which had previously been excluded. The broader baseline will allow a more comprehensive case for action to be produced, with an updated 'Financial and Carbon Value at Stake'. The Project Team has already begun identifying and quantifying both existing and new carbon saving projects. Some of the larger projects are described in more detail below.

6.4 By December there will be a draft five-year Carbon Management Plan (CMP) which, after review by the Authority and quality assurance by the Carbon Trust, will set out: the footprint-reduction targets, the projects that will be completed, and how they will be financed. The CMP will be reviewed and updated each year with progress recorded. The CMP will include all major projects which lead to carbon savings - regardless of whether they are existing or planned projects.

6.5 The work on the PSCM and the CMP will help fulfil commitments made when the Authority signed the Nottingham Declaration on Climate Change.

7 Service Headquarters carbon saving projects

Review of heat supply and heating systems

7.1 The Service commissioned our property services advisers at Hampshire County Council to prepare initial feasibility options for significant improvements to the space heating and domestic hot water systems in the main Headquarters building. This included: a review of possible heat sources including boiler replacement; district heating options; and, options for improving the control and distribution of heat to improve energy efficiency and staff comfort. Opportunities to undertake, at the same time, other building improvements and/or maintenance works were also identified.

7.2 Replacing the gas boilers at Headquarters with a heat only connection to the Combined Heat and Power district heating scheme operating within neighbouring Eastleigh Borough Council land has been assessed as feasible and further investigation is taking place to clarify if a 21 year heat supply agreement represents a good long-term option for supplying heat to the building. The cost of replacing the existing boilers with higher efficiency modern boilers has also been estimated. The estimated cost of connecting to the district heating system is £145,000. The boiler replacement cost is estimated at £100,000. It will be the whole life cost calculation (including cost of ongoing heat/gas supply and maintenance) which will determine which is the best option for the medium- to long-term. When further detail has been obtained a full business case will be presented to the Committee for approval. It is anticipated that the Authority's Improvement and Sustainability reserve would be used to fund the work.

7.3 As well as investigation of the means of supplying heat the inefficient design and lack of control over the space heating (radiators) and large quantities of stored hot water have been assessed. Proposals have been put forward to improve the level of control and improve the efficiency of both space heating and domestic hot water. This work is required to capitalise on the improved insulation of the recently installed double-glazed window replacements. Without improved heating controls offices could be too warm – which is uncomfortable for staff and financially and environmentally wasteful. As improved controls are necessary irrespective of the heat source it is recommended that approval be given for improvements to be made to the heating and hot water systems at Headquarters in advance of any decision on a district heating connection or boiler replacement project.

7.4 The current proposals for improvements are fitting of improved zone controls; improved insulation; fitting of thermostatic radiator valves; and reduction in hot water storage. These proposals have an estimated cost of £54,000 and it is recommended that this be funded from the Authority's Improvement and Sustainability reserve with the intention of completing works prior to the start of the winter so that immediate energy reductions can be made.

7.5 The proposed heating improvements will allow more active management of the heating and result in an estimated 20% to 25% cut in heating costs, a saving of £8,300 to £10,300 a year (at current prices). The payback would therefore be in five to six years, with an annual saving of 55 to 69 tonnes of carbon dioxide. As with all improvements to heating controls some of the savings rely on building users' behaviour – e.g. correct operation of thermostatic radiator valves. So, the work will supported by an awareness campaign (supported by our workplace-based Environmental Champions) to help staff to understand the changes.

Voltage Optimisation

7.6 Owing to changes in European regulations on the allowed voltage of electricity supplies it is now possible to make savings in both cost and carbon footprint by installing equipment to reduce the voltage of the electricity supply to a building.

This also brings further benefits of reducing the effect of surges and imbalances between the 3 phases of the supply. This technology has been proven over a number of years. The Service was successful in obtaining an interest-free loan from the government funded Salix SEELS2 loan scheme to cover the cost of the equipment and its installation for the main Headquarters building. The £27,500 loan is repaid at regular intervals out of the expected 10% savings on electricity costs (about £7580 a year and 47 tonnes of carbon dioxide a year). The payback period is expected to be around 4 years and that the savings will more than meet the loan repayments. The procurement and installation of the equipment must be completed by the end of October to meet the requirements of the loan scheme.

8 Environmental Champions' update and 'quick wins' bids

8.1 A pilot introduction of volunteer Environmental Champions in the four 'Eastleigh and Test Valley Group' of fire stations has already shown some success. The pilot has indicated that staff are more willing to volunteer as Environmental Champions when they can see a clear commitment to the role from their Group and Station Managers and know that other stations are taking part. The assistance of the Group Manager (Jason Avery) in promoting the importance of the role and taking an interest in progress has been particularly noteworthy. Across the four stations (two wholetime and two retained) the Group has estimated that they have made a saving of over £2,100 on utility use for the past four months.

8.2 The Environmental Champions have been actively involved in identifying areas of improvement both in staff behaviour and in their physical station environment; and have met to share experiences. Some suggestions have provoked fierce debate amongst staff – unexpectedly helping to raise the profile of environmental issues - even if suggestions are not progressed. The champions have reported that in the main other staff have been receptive to hearing ideas and willing to change their behaviour because they are already starting to see some progress. This confirms that providing a focus on ideas that produce a quick win – no matter how small – helps to develop further engagement and gives the champions confidence that they can make a difference.

8.3 The experiences from the pilot will be used to support the recruitment of volunteer Environmental Champions across the service. The Environmental Champions network will be an included in the Carbon Management Plan as a carbon saving project linked to changing staff behaviour. Many carbon saving projects have components related to small changes in behaviour which the Environmental Champions will help support.

8.4 In recognition of the importance of staff engagement in carbon saving, the Service has established a £50,000 budget from 2011/12 to fund bids from fire stations for energy-, water- and fuel-saving projects. The focus will be on 'quick wins' that will encourage further improvements. To ensure that applications consider the behavioural aspects of achieving successful changes they must be developed with the support of the station's Environmental Champion.

9 Opportunities for investment in Solar Photovoltaic systems (Solar PV) on Service buildings

9.1 The Government's 'feed-in tariff' (FIT) scheme has significantly improved the financial viability of installation of roof mounted Solar PV panels for electricity generation. Under the scheme the Service would be paid for the electricity the panels produce – even if it uses it itself. The Service would also be paid a small additional amount for any surplus electricity which goes back to the national grid. The FIT provides a 25 year income stream at rates which are linked to inflation (Retail Price Index). The scheme was specifically designed to stimulate the market for Solar PV within the UK and generally provides paybacks of roughly 10 to 15 years. Whilst the length of this payback period is beyond normal expectations, it is justified by the long term nature of the FIT scheme and the other significant savings in offset electricity costs. To promote early uptake the 2011-2012 rates were set high with lower rates for 2012-2013.

9.2 In March 2011 the Government announced a fast-track review of the FIT levels due to the higher than expected number of very large Solar PV installations. The fast-track review resulted in cuts to the tariffs above 50 kWp in size. The Service is unlikely to have suitable sites for schemes that large. A full review of the tariff rates will take place in a few months time – this is now likely to include a review of the published 2012-2013 rates. This has introduced uncertainty and increased urgency into Solar PV projects as they would need to be complete before the end of March 2012 to benefit from the best tariff rates.

9.3 Because of the good return on investment created by the FIT many companies are offering to provide free panels and installation in return for collecting the FIT income for 25 years. All the building owner gets is the electricity produced by the panels. It is clear that it is far better for the Service to own its own solar PV panels and benefit from both the FIT and the electricity generated. To maximise this opportunity the Service would need to make substantial financial investments in Solar PV panels for many of its buildings. The fastest paybacks are likely to be on larger sites where the buildings would use all of the electricity generated. This is because the cost per kWh the Service pays for electricity is almost 3 times higher than the FIT payment for each kWh of surplus electricity sent back to the national grid. Due to the FIT payments reducing as the size of the panel installation increases, there are also some situations where it would not be economic to maximise the size of an installation if it just crossed over a tariff threshold.

9.4 As part of the drafting of the supporting information for the Solar PV priority on the Hampshire-wide Climate Change Partnership, a desk-top review of the Authority's buildings was undertaken by Hampshire County Council engineers. This data indicates that building roof areas in excess of 4000m^2 might be available for Solar PV. Review of the data suggests as much as 2600m^2 of the total is contained within the 13 wholetime fire station sites and the Headquarters site. A conservative estimate of the peak generating capacity of 2600m^2 of Solar PV would be 250kWp. The cost of installation is currently estimated to be in the range £1m to £1.25m.

9.5 Not all buildings have suitable roofs for Solar PV. They may face the wrong direction; tilted at the wrong angle; shaded by other buildings/trees; not strong enough to support the weight of the panels; roof access may be physically restricted; or the roof may require repairs over the next few years. As the panels are expected to have a lifespan of around 25 years (some earlier panels are known to have lasted much longer) most roofs would require some kind of major repair work – which would require the panels to be removed and replaced at additional cost. Some buildings may be expected to be replaced within the next 25 years – this must also be factored into decisions about where to install panels. Some sites will also be at a higher risk of vandalism than others

9.6 Because not all the building roof areas identified in the data will be suitable - and while some efforts have been made to exclude unsuitable buildings or roof areas - the final investment/business case would need to include a detailed survey of each building.

9.7 By accepting the recommendation to continue to investigate a programme of installation of Solar PV installation on some of the Authority's larger buildings it would be possible to assess options for involvement in projects being run by other local authority partners and available national frameworks. A detailed business case for each suitable building could be developed as part of the procurement process. The Authority's decision on the scale and location of investment would then be based on that detailed business case.

9.8 While it is desirable that any installation programme would complete before the end of March 2012 in order to benefit from the maximum FIT rates this may not be logistically possible. The proportion of installations which can be completed before March 2012 will depend on how soon procurement can begin and on the ability of the chosen supplier(s) to conduct multiple installations. Many public sector bodies and private companies are going through the same process and there may not be sufficient local capacity within the industry to meet the simultaneous demand from all organisations.

9.9 After the review of FIT rates, installations will still be viable - but may have longer payback periods. This will be sensitive to the size of scheme involved. Viable installations expected after 2011-2012 could be considered for inclusion in the capital programme for 2012-2013 and 2013-2014, and/or funding from the Improvement and Sustainability reserve.

10 Supporting our corporate aims and objectives

10.1 The corporate objective: "We will use energy more efficiently at our buildings" is a key aspect of the Authority's priority to reduce the Service's carbon footprint. Participation in the PSCM programme supports this.

10.2 To reinforce our determination to make progress, it is recommended that an appropriate 'statement of commitment' to the PSCM be produced and jointly signed by the Chairman of the Authority and the Chief Officer at the Authority's next meeting (September 2011).

11 Risk analysis

11.1 By identifying and financing carbon saving projects for the PSCM programme the Service reduces its long-term exposure to energy price rises. The recent Ofgem Project Discovery review looked at different scenarios for the UK energy market from 2009 to 2020. The results showed an overall increase of between 94% and 115% in electricity costs, and 64% to 139% in gas costs by 2020. In some scenarios the prices actually peaked at more than 150%. Price increases of this kind would substantially improve the business case for all energy efficiency and renewable energy projects and reduce the payback periods. For example, all the electricity that Solar PV provides is protected against price rises – this reduces exposure to future price increases as well as producing a significant carbon footprint saving.

11.2 Work needs to continue on the detailed business case for investment in large amounts of Solar PV because of the possible scope, long-term nature of the investment, and the uncertainty around the Government review of FIT rates.

11.3 The savings from improvements to the Headquarters heating systems are estimated and partially rely on the behaviour of the occupants. In order to ensure the full savings are realised the work will be followed with an awareness campaign (supported by Environmental Champions) to enable staff to understand how to make the most from the changes.

11.4 The Headquarters voltage optimisation installation will involve an interruption to the main power supply to the site. In order to manage the impact of this and insure that the installation does not adversely effect any critical systems the specification for the work will include review of voltage settings on critical systems. The final installation will only proceed once the Service is satisfied that the work is fully compatible with all critical systems.

12 People Impact Assessment

12.1 The proposals in this report are considered compatible with the provisions of the European Convention on Human Rights, the Human Rights Act 1998, and the Race Relations (Amendment) Act 2000.

13 Environmental and Sustainability impact assessment

13.1 This report and its recommendations are all about reducing our environmental impact and improving the sustainability of our operations. Several projects are identified which involve reducing our carbon footprint.

14 Resource implications

14.1 Human Resources

Current environmental work including the coordination of the PSCM programme

can be progressed using the Environmental Impact Project Coordinator but this situation may change as projects develop. For the Headquarters heating proposals the Property Services Manager will coordinate the work. The requirement for staff resources for project management of any significant Solar PV installation programme has not yet been assessed and will be dependent on both the scale of any programme of work and the nature of its procurement.

14.2 Physical Resources

None

14.3 Information and Communications Technology Resources

None

14.4 Financial Implications

Estimated costs associated with specific projects and activities have been set out in the relevant paragraphs of the report. The 'invest to save' projects described have long term financial implications and include utilising existing Improvement and Sustainability Reserves.

The report recommends £54,000 is released from the Improvement and Sustainability reserve now to fund the improvements to the Headquarters heating systems referred to in paragraphs 7.4 and 7.5.

The voltage optimisation equipment at Headquarters is being funded through an interest-free loan which will be repaid from savings in electricity costs as described in paragraph 7.6.

Within 2011-2012 further detail on the case for connection of the Headquarters building to a district heating scheme will be provided – it is anticipated that this would result in a call for £145,000 from the Improvement and Sustainability reserve. Alternatively this could be considered for inclusion in the 2012-2013 capital programme.

There is currently high uncertainty around the timing and scale of investment for Solar PV. If it is possible to deliver some installations in 2011-2012 that work would require funding from the Improvement and Sustainability reserve. The total scope for investment is large (£1m to £1.25m) and installations during 2012-2013 or 2013-2014 would be suitable for inclusion in the capital programme.

As the identification of projects for the PSCM continues over the next six to eight months there are likely to be further proposals for funding both from the Improvement and Sustainability reserve and for inclusion of work in the 2012-2013, 2013-2014, 2014-2015 and 2015-2016 programmes (covering the 5 years of the Carbon Management Plan).

15 Background papers

15.1 The following documents disclose the facts or matters on which this report, or an important part of it, is based and has been relied upon to a material extent in the preparation of the report:

None

Note: The list excludes: (1) published works; and (2) documents that disclose exempt or confidential information defined in the Act.