

# Use of Resources Topic Review – Energy Management in Buildings Interim Report

## Report to the Corporate Policy and Performance Board

### 1 OVERVIEW

**1.1** The Corporate Area Assessment (CAA) includes an annual Use of Resources assessment, part of which indicates how well the Council is making effective use of natural resources. The CAA covers energy, clean water, land and soil and materials. The three key areas of focus are

- 1) How well the Council understands and can quantify its Use of Natural Resources and can identify the main influencing factors;
- 2) How well the Council manages performance to reduce its impact on the environment;
- 3) How well the Council manages the environmental risks it faces, working effectively with partners.

**1.2** The Policy and Performance Board agreed that the Use of Natural Resources topic should form part of their work programme for 2009/10. Given the broad nature of the topic area the Board agreed that they should initially focus on a small number of key areas that offered the greatest scope for reducing the use of resources.

**1.3** The review was started with a report to the Board in September 2009 which provided a baseline statement of the Council's approach to the key areas covered by the CAA. The report was a useful guide to help the Board select key areas to focus upon. The report highlighted that the Council's total energy bill in 2008/09 was £2.9m and CO<sub>2</sub> emissions from all its activities amounted to 26,778 tonnes of CO<sub>2</sub>.

This broke down as follows:

	CO <sub>2</sub>	CO <sub>2</sub> %	Cost
Schools	8,127	30%	£0.6m
Other Council Buildings	10,194	38%	£0.7m
Streetlighting	6,448	24%	£0.6m
Vehicle fleet	1,227	5%	£0.3m
Business miles, casual/essential	503	2%	£0.7m
Waste	279	1%	
	26,778	100%	

**1.4** In 2006 Halton Council joined the Local Authority Carbon Management Programme (LACMP) and committed to reduce CO<sub>2</sub> emissions by 20% (4891 tonnes) between 2006/7 and 2012/13. Since 2006/7, despite the introduction

of a range of positive measures that individually have reduced CO2 emissions, total emissions have risen by approximately 8%. Much of the work to date has focussed on Council buildings and in this area there has been a slight reduction in emissions of 3.7%.

**1.5** Based on the finding of the baseline the Board decided to focus their attention initially on the Council's approach to energy management in buildings.

## **2 SUMMARY**

**2.1** Reducing energy consumption saves an organisation money that can be used for frontline services, enhances its reputation and contributes towards a reduction in carbon emissions. Energy is a controllable overhead in many buildings, so there are opportunities to make savings. In Halton the total cost of energy from buildings is approximately £1.3m

**2.2** The Council has expressed its commitment to reducing the impact of its operations on the environment by signing the Nottingham Declaration and through its participation in the LACMP. The review has identified that the Council's involvement in the LACMP has led to the implementation of a range of successful initiatives that have reduced carbon emissions and costs in Council buildings. These have been a combination of low cost initiatives around staff engagement and the implementation of technical solutions.

**2.3** The review has determined that energy savings are achievable across the Council with some initiatives requiring little outlay. Many of the opportunities are within the control of staff who are key factors in driving the energy saving concept. However, to successfully implement change across the Council, Senior and Service Managers need to take a more proactive lead. This approach needs to be supplemented by a dedicated staff and financial resource to support managers to understand the costs of energy and how they can engage and encourage staff to reduce consumption

**2.4** The Group acknowledges the Council's commitment to the reduction of energy consumption and recognises the work of the Carbon Reduction Working Group whose work has helped make considerable progress in introducing energy saving initiatives in Council buildings and services.

## **3 MEMBERSHIP OF THE REVIEW GROUP**

**3.1** The Review is being undertaken by a Working Group comprising of:-

- Councillor Gilligan (Chair)
- Councillor Lowe
- Councillor Bradshaw
- Councillor Browne
- Councillor Inch
- Councillor Cargill
- Councillor Norddahl

### **3.2** The Group are supported by the following officers

Jim Yates – Principal Executive Officer  
John Hughes – Head of Operations Property Services  
Debbie Houghton – Policy Advisor  
Dick Tregoe – Strategic Director Environment  
Alex Villiers – Scrutiny Officer  
Gill Fenna – Local Improvement Adviser

## **4 TERMS OF REFERENCE**

### **4.1** The Working Group agreed the following terms of reference:-

- to consider the Authority's current approach to energy management in respect of its buildings (including schools)
- to identify initiatives and proposals that will maximise energy efficiency in buildings and provide a positive contribution to reducing carbon emissions and ensure investment represents value for money
- to consider opportunities for the use of renewable technologies in Council buildings
- to identify the financial implications arising from such proposals
- to identify possible sources of funding to support their implementation.

### **4.2** The key outcomes from the Review are:-

- Develop a model of best practice that would give the Council the most sustainable and affordable way forward for managing energy use in Council buildings
- Recommendations on how the Council can reduce its emissions from buildings
- Recommendations on how the Council can embed carbon management principles across its broad range of services
- Recommendations on potential sources of funding to support the implementation of carbon reduction opportunities

## **5 METHODS OF ENQUIRY**

### **5.1** The Group received evidence/information from the following internal and external sources:

Head of Operations Property Services  
Project Co-ordinator, LACMP  
Stadium Manager  
Liverpool City Council

Knowsley Metropolitan Borough Council  
Gill Fenna – Local Improvement Advisor NWEA  
St Helens Metropolitan Borough Council  
Carbon Trust  
Energy Saving Trust  
Beacon Councils on Sustainability

## **6 RECOMMENDATIONS TO THE EXECUTIVE BOARD**

**6.1** As a result of their investigations to date, the Group have identified a number of interim recommendations. These have been developed on the basis of the evidence detailed in the findings section of the report.

### **6.2 Monitoring & Reporting**

1. Once the Automatic Meter Readings are installed a performance management system is developed to report consumption data for individual buildings and monitor trends comparing year on year usage on a monthly basis. The new Centre of Excellence for Performance Management be asked to support the development of the performance management system.
2. Data from the performance management system, together with progress on significant projects, be reported to the Carbon Reduction Working Group and the Corporate Policy and Performance Policy Board
3. Service Area Business Plans include building energy and water use data, costs and carbon emissions, and targets to reduce these in line with the overall Council target
4. Managers be given access to AMR website data where they can view instant energy reports. Managers, with the support of the Sustainability Project Officer use the information to monitor site performance and engage with staff to explore ways in which they can reduce consumption.
5. To support the introduction of AMRs and the creation of a performance management system for energy management, consideration be given to purchasing a software system to identify areas and trends of high consumption and in particular to monitor and explore how night loads can be reduced.

### **6.3 Energy Management**

1. To ensure that the Energy Management Policy is fully implemented the Council provide a dedicated resource to monitor AMR data, report against baselines, identify high levels of consumption, carry out additional audits on Council buildings where high consumption is identified, and draw up programmes for energy efficiency schemes within Council buildings. In the first instance the role of the Sustainability Officer within the new Environment Directorate be reviewed with a view to these functions being included in the post holder's responsibilities.

2. During 2010/11 the Carbon Reduction Group, in consultation with Corporate and Policy Performance Board, be asked to draw up a programme of works arising from the multi site audits currently being carried out by the Carbon Trust.

3. To continue to support the work ongoing in IT to reduce the impact of emissions from the IT infrastructure and equipment. The Carbon Reduction Working Group, in consultation with IT develop a detailed action plan to reduce the impact of emissions from the future use of IT, with particular emphasis on the data centre room.

4. Given the significant level of carbon emissions from schools and the impact that schools will have on the Council's CRC commitment, further work be undertaken with a view to exploring how schools can be supported to reduce their energy consumption. Initially, a pilot should be undertaken with a small group of schools to explore the merits of the Eco Schools Programme.

5. Consideration be given to develop a specific schools programme drawing on the good practice from other schemes e.g from Rochdale MBC and CREATE.

6. As part of the any future building refurbishment programmes a full audit and assessment be undertaken to ensure that energy efficient measures are included in the refurbishment plans.

7. As part of future refurbishments, where practicable, break out facilities and zonal heating be provided to enable individual items of electrical equipment to be removed from offices. In the meantime an audit of offices be undertake to see whether shared arrangements can be adopted across offices to reduce the number of electrical items currently used.

#### **6.4 Training**

1. Managers be supported by the development and delivery of an in house training course. The Carbon Reduction Working Group together with the Training Centre devise a short in house training programme to be delivered to all managers

2. The Council continue to develop promotional activity through posters, stickers and to support staff and managers the Carbon Reduction Group is asked to review the Green Guide with a view to distributing it to all managers to share with employees and look at developing a specific space on the intranet to provide good housekeeping advice to employees

3. The Council take advantage of national campaigns such as Energy Awareness Week run by the Energy Saving Trust to run its own internal campaigns, and identify opportunities for external support for internal programmes.

## **6.5** Devolved Energy Management

1. Once the training programme has been rolled out to managers, initially all self managed buildings (ie libraries, Community Centres and Children Centres etc) to adopt the good practice model implemented by the Stobart Stadium and

- adopt an Energy Mission Statement and set up an Employee Group to monitor implementation of the Policy and monitor consumption on a monthly basis. Where appropriate this be built into the existing Core Brief monthly team meetings
- arrange training for their staff on good housekeeping techniques, including casual and agency staff
- share with all staff the cost and usage of energy based on monitored meter readings A table of energy usage comparing year on year usage be produced each month and used in monthly team meetings
- identify, with staff a range of opportunities for saving energy through good housekeeping.
- appoint individuals to carry out energy audit walkabouts and report back to the Group on the range/level of equipment left on when not in use,
- introduced a “switch off” campaign, supported by promotional material,
- put up promotional energy saving literature from the Carbon Trust Web Site around the building.

## **6.6** Procurement Policies

1. That as part of the future procurement of plant and equipment whole life costing principles be included in the tender evaluation

2. All future building refurbishment programmes are underpinned by whole life costing principles

3. All future refurbishment schemes be shared with External Funding with a view to developing bids for any external funding opportunities that may be available to the Council.

4. As part of the BSF programme the proposals for carbon reduction ensure that BSF schools actually reduce energy, despite the increased demand on facilities

## **6.7** Finance

1. As part of the 2010/11 budget process consideration is given to establishing an Energy Fund, from the Invest to Save Budget, to support the implementation of projects arising from the Carbon Trust multi site audit, and others assessed as economically feasible or alternatively ring fence a proportion of the Invest to Save budget for energy efficient projects

2. Subject to funding being made available the feasibility of applying to Salix to match this Energy Fund should be investigated.

3. Subject to funding being made available criteria be developed to assess the Carbon Abatement costs of individual schemes and schemes that demonstrate that the combined energy savings and costs of carbon credits are more favourable than buying carbon credits should be implemented through the scheme.

4. To support the Council's preparations for the Carbon Reduction Commitment consultation be undertaken with the Carbon Trust with a view to the Council adopting the Carbon Trust Standard in order to reduce the financial liability of the CRC. This work be monitored through the Carbon Reduction Group.

5. The Programme of works following the Carbon Trust audit recommendations should be shared with the External Funding Unit to explore opportunities for attracting grant funding for projects.

6. Further discussions take place with the Children and Young People's Directorate about the impact of CRC and the potential to use Salix Finance for school projects.

## **6.8 Renewable Energy**

1. The Council's position on introducing renewable energy sources into the building portfolio be noted but further work be undertaken as part of future refurbishment schemes to assess the feasibility of developing renewable energy sources in the light of the introduction of Feed In Tariffs and the proposed Renewable Heat Incentive.

## **7 REVIEW FINDINGS**

### **7.1 Legislative Framework**

There is growing demand on the organisation to manage its resources more effectively and reduce the impact of its operations on the environment. There is now a raft of legislation that requires the UK to cut carbon emissions. Carbon reduction targets are included in the Climate Change Bill and the requirement to display Energy Certificates in buildings over 1,000sq m is included in the European Energy Performance in Buildings Directives. Central Government has made it clear that local authorities have a key role to play in reducing emissions nationally. The Council's performance in managing its emissions is now measured through NI185 and the Use of Resources Assessment.

## 7.2 The Carbon Reduction Commitment

The Carbon Reduction Commitment (CRC) is a new mandatory carbon emissions trading scheme that begins in April 2010 and has financial consequences. It applies to public and private sector large non-intensive energy users that consume around £0.5 million of half hourly electricity and will cover almost all energy use thereafter. DECC currently estimate that around 5,000 organisations will participate in the scheme.

Most county and unitary councils will have a legal obligation to participate in the scheme and to take responsibility for state funded schools and academies. This means that all council operations are included, such as administrative offices, leisure centres, social care homes, etc.

CRC participants must account for at least 90% of their emissions and will be required to calculate and purchase carbon allowances each April, to cover emissions generated at a fixed price of £12 per tonne of CO<sub>2</sub> for the first three years and then through an auction. For Halton Council the initial cost in 2010/11 will be around £200,000. Some of this money will be returned to CRC participants each October depending on their league table position, which is determined by their performance in reducing emissions from energy use against the performance of others in the scheme. This means that 6 months will exist between paying for allowances and receiving a recycling payment, which may exceed or be less than the cost of allowances purchased, introducing budgetary uncertainty.

The league table will be publicly available and it is widely expected that it will have a reputation risk or enhancement value. Importantly, the league table position will also determine a bonus or penalty factor applied to a participants recycling payment. The scheme's aim is to reward a well performing organisation while penalising those with poor performance. This will start at  $\pm 10\%$  in Year One but rise to  $\pm 50\%$  by Year Five. Although these league table performance metrics are fixed, the actual financial penalty and bonus can be even greater or lower than these percentages.

Councils will have responsibility for state-funded schools (including Academies). This means that a constructive dialogue for sharing data and reducing energy consumption in schools should take place. The risk of a cross subsidy through the CRC of the councils general funding stream and its dedicated schools grant should be addressed urgently.

The CRC places a statutory responsibility on organisations to understand their carbon footprint, monitor and accurately record the amount of energy that they use. There are financial penalties for non compliance and inaccurate reporting of data. The pro-active use of this data provides real opportunities to improve the transaction efficiency of management systems, save money by reducing energy consumption, and achieve better energy contract prices.



Installing AMRs across the Council's buildings will help the Council improve its position in the league table and ensure that the Council would not be fined for non compliance with regards to data collection and reporting requirements. The Council's position could be further enhanced by seeking the Carbon Trust Standard but there is a cost of between £5,000 - £8,000 towards this and in order to achieve the Standard the Council would need to demonstrate that it had robust data collection procedures and an action plan for reducing emissions from its buildings. At the present time the Council does not have a specific action plan to reduce emission from buildings but there have been a number of individual projects carried out through the LACMP. A multi site audit being carried out by the Carbon Trust will offer the Council the opportunity to develop a plan but this would need to be supported by financial resources. In developing action plans the review heard that in deciding what schemes would be beneficial Marginal Abatement Costs should be taken into account. These included a number of variables attributable to a specific energy project.

### **7.3 Tackling Energy Reduction**

The Carbon Trust advocates a structured approach to energy management as experience shows that there is a clear sequence of events that brings about better results.

The key principles of a structured approach were

- To allocate a staff resource to oversee the implementation of an Energy Policy
- The development of an Energy Policy to establish energy reduction targets and timetables, supported by financial resources
- The development of a staff awareness campaign and training programme
- The implementation of a structured approach to energy audits across the Council's portfolio
- The development of an ongoing implementation plan based on the audits findings
- A performance monitoring process to measure the success of the Plan

The Review identified that the Council already has an Energy Management Policy. The Policy aims to pursue energy efficiency in the design, maintenance and management of buildings. The key objectives are to:-

- gain control over energy consumption by reviewing and improving our purchasing, operation, motivation and training practices
- safeguard the gains by establishing and maintaining a management information system designed to ensure that information is delivered to

those who need it, on time and in a form which supports their decision making

- invest in a rolling programme of energy saving measures which will maximise returns on investment in order to generate funds, which can be re-invested, at least in part, in further energy management activities
- carry out energy and water audits on a prioritised basis focussing on high usage properties. A sum of money will be dedicated for this purpose.
- raise awareness and promote good practice amongst staff and users and to promote the benefits of energy efficiency.

The Policy advocated a performance management system to report on energy management consumption and activities.

The Panel felt the Policy itself was sufficiently robust and in comparison to the Carbon Trust good practice model compared favourably. However, from the evidence presented it was identified that the Policy was not being fully implemented. Since the Council's involvement in the LACMP energy efficiency initiatives are proactively promoted in the design and refurbishment of buildings. A programme of water audits has been undertaken and more recently a prioritised series of energy audits are being undertaken by the Carbon Trust, although this is only a recent initiative and there are no plans to continue this after the multi site audit has been completed. There is currently no dedicated budget to fund energy efficiencies but some projects have been implemented through the Invest to Save Budget. There have been a range of activities within the Council to raise awareness of energy management but this still needs to be further embedded across the Council. Baseline data is collected but there is no performance management system to monitor consumption and activities. There is currently no dedicated resource in post to implement the recommendations of the LACMP - the Energy Saving Trust recommends one full time post per £1m energy spend.

As such the Panel felt that whilst positive steps are being taken, the Council's approach is piecemeal and lacks strategic co-ordination. The Panel felt providing a dedicated staff resource to monitor the baseline data to identify high levels of consumption, carry out regular audits and support managers to address high consumption level would ensure the Council Policy would be more in line with the Carbon Trust good practice model. This should be supplemented by a dedicated budget for implementing energy management improvements.

#### **7.4 Energy consumption benchmarking**

The review heard that the Carbon Trust identifies typical and good practice benchmarks for a variety of local authority buildings. The energy consumption in the Council's buildings and schools is in many cases in excess of the Carbon Trust's typical and best practice standards. There could be a number of factors affecting this such as the age of the building, hours of operation and design features such as heating and boiler controls.

Energy consumption in the Council's buildings and schools is, in many cases, well in excess of the Carbon Trust standards. The Carbon Trust Toolkit used as part of the Carbon Management Programme includes 110 sites that include a comparative typical and best practice standards for consumption.

Electricity consumption performance at 68 sites (62%) is worse than both the typical standard and the best practice standard for comparative sites. A degree of caution needs to be taken with the above figures given potential discrepancies in the baseline data. The age and design of many of the Council's buildings and schools will be key factors as many have potentially inefficient plant and equipment. The Group considered that developing a more structured approach to energy management could increase the number of buildings that were compliant with the Carbon Trust benchmarks.

## **7.5 Energy Consumption Data and Baselines**

Energy consumption data is currently obtained from a combination of actual meter reading and estimates. Property Services co-ordinate the payment of all energy bills for the Council buildings, with the exception of schools. Property Services maintain a record of energy use for all sites. Data is extracted from the energy invoices and input into the P2 system retrospectively with some of the information based on estimated readings.

Schools receive energy invoices directly from their energy suppliers and are responsible for organising payment from their delegated budgets. Schools who purchase their energy through the corporate contracts do not need to send invoices as Property Services can obtain data from the utility companies. Currently only 3 schools purchase from outside the contract and there are systems in place with these schools in order to obtain data, so data collection is not a really an issue.

As part of the LACMP the Council input all the data from the P2 system into a spreadsheet to develop a carbon baseline. The baseline year was 2006/07. Based on the information input the Council carbon footprint from buildings was 17,776 tonnes of CO<sub>2</sub>.

Current data shows that despite pro-active measures being taken to reduce consumption, CO<sub>2</sub> emissions from buildings have risen slightly from 17,776 tonnes in 2006/7 to 18,321 tonnes in 2008/9. Although for Council Buildings there has been a slight reduction from 8477 tonnes to 8127. Factors such as an increase in IT equipment and longer building opening hours since core hour were removed will have an adverse effect on the measures implemented. In addition, due to the estimated bills the 2008/09 figures may be slightly above the true consumption data.

## 7.6 Targeting and performance monitoring

A consistent message in the evidence received is that monitoring and targeting is the foundation for developing energy savings. The evidence presented to the Group indicated that there are still significant gaps in the monitoring of energy use. Developing a more robust monitoring system is important in taking forward a co-ordinated approach to energy efficiency. The Panel highlighted that the Council's spend on energy is £2.3m but this is not currently actively managed.

The Council's ability to monitor, analyse and manage energy consumption effectively has been limited by a lack of monitoring technology across the Council's sites i.e. the lack of accurate consumption data reading technology (AMRs), and a lack of sub metering within various departments or on a floor by floor basis (e.g. the Municipal Building only has one meter so we can not sub divide data). Property Services have clear responsibility for energy management but without a dedicated resource it makes it more difficult for the Council to:

- Actively monitor usage in order to analyse data targeting areas of waste
- Research grant funding opportunities
- Budget accurately for future energy costs
- Identify opportunities for reducing consumption and CO2 emissions
- Reduce energy costs
- Collect comprehensive data for emissions
- Ensure that the appropriate number of credits are purchased for the Carbon Reduction (CRC) Scheme

AMRs are currently being installed on all sites where possible. This technology should be fully operational by April 2010 so data for electricity and gas will then be available across these sites. This will enable consumption to be analysed in more detail which will help in the detection of increased consumption due to failed or faulty equipment enabling corrective action to be taken.

Whilst this will improve the Council's ability to collect accurate data, the ability to fully utilise this information will be limited if no dedicated resource is available to manage and use the data and the Council has no software system to monitor trends, night loads and areas of high consumption.

The Group has received evidence from Liverpool and Knowsley who saw significant financial benefits from this approach particularly looking at how to reduce base loads at night when a significant proportion of energy is used when buildings are unoccupied.

### Energy Management Systems

Evidence from **Liverpool** showed that their use of software had helped them to identify energy base loads of buildings and had highlighted that nearly 60% of their energy was used outside office hours. Liverpool is using this information to explore how they could reduce base loads at individual buildings.

**Knowsley** have a team of four staff dedicated for energy management (although one member is focussed on domestic properties). Knowsley collect data on energy use for all their buildings and similar to Liverpool used an energy management software system (Eco Warrior) to help performance manage consumption. Each year an annual report is produced setting out annual costs and consumption for each directorate and schools. Data on individual buildings is also reported with comparisons from the previous year showing whether consumption has increased or decreased. The software system can prepare drafts on a monthly, daily, quarterly basis that can be shared with those responsible for the building. The data could be used to set targets for reducing consumption in buildings.

During the year one member of staff from the dedicated team continually analyses data from the Eco Warrior system to identify anomalies/potential increases in consumption at the various sites. Where consumption is increasing site visits are undertaken and discussions take place with those responsible for building management in respect of good housekeeping and to look at potential technical improvements such as changes to boiler controls, heating controls, temperature levels, lighting controls etc. Meetings are arranged with the staff to explain good housekeeping methods and audits of buildings are undertaken to identify technical measures that could be introduced to reduce consumption.

Annually staff awareness training is delivered by the dedicated team. This is normally arranged by sector i.e. leisure buildings, social care buildings, educational establishments etc.

The Panel felt strongly that an Energy Management Strategy supported by a dedicated staffing resource and budget would provide a more strategic and co-ordinated approach. The Panel heard that within the new Council Structure a post was being established to help support the delivery of sustainability projects. The Panel felt that this post should be utilised to provide some support to building managers to help them reduce and performance manage energy consumption from buildings they had responsibility for.

At the present time energy costs are not assigned to departments and no targets are set for individual buildings. This is partly as most buildings only

have one meter and as such it is not currently possible to assign costs to departments. It is only possible when a single department or service is responsible for the whole building. At the present time, the majority of utility bills are based on estimated readings although the installation of AMRs will enable the Council to obtain 100% accurate consumption data. The AMR installation programme will be completed prior to the start of 2010/11

At the present time service plans make reference to the Council's commitment to reduce emissions by 20% over the next five years but individual services do not specify how they will help contribute to this overall target.

In order to improve the monitoring and performance of energy usage the Panel would like to see the following activity implemented when AMRs are fully installed.

Service Area Business Plans should include building energy and water use and carbon emission reporting for buildings.

Managers should be given access to AMR website data where sites can record their own meter readings and view instant energy reports. Managers, with the support of the Sustainability Project Officer should use the information to monitor site performance and engage with staff to explore ways in which they can reduce consumption. The model adopted by the Stadium Management should be implemented across all buildings.

Managers should be supported in the process by the development and delivery of an in house training course.

## **7.7 Implementation of Energy Efficient Measures**

The Panel heard that energy audits were not currently carried out on a priorities basis focusing on high usage properties. Display Energy Certificates and associated energy reports are carried out at all public buildings over 1000sq/m. This gives general information with regards potential for reducing energy consumption but these are not used to identify future energy saving projects. The Panel noted that since the Council had been involved in the LACMP a number of successful projects had been implemented which had reduced consumption.

The Council has installed voltage optimisation equipment at 7 sites: Kingsway Learning Centre, The Brindley, the Corporate Training Centre, Municipal Building, Stobart Stadium, Widnes Market and Runcorn Town Hall.

There is an ongoing programme to install devices in the following buildings: Halton Lea Library, Rutland House, Waterloo Business Centre, Picow Farm Road, Widnes Direct Link, Halton Lea Direct Link, Runcorn Market Hall, Oak Meadow, Lowerhouse Lane Depot.

A case study undertaken at the Stadium indicated that the voltage optimisation equipment is reducing consumption by at least 14½% which equates to an annual emissions saving of 165,080 kilogrammes of carbon. The Council has recently secured £100,000 in the form of an interest free loan from Salix to complete this programme.

The Council has entered into a three year contract in late 2008 with a company called ADSM who are a water management company. They carried out water audits at all corporate sites (not schools) with regards water consumption. They identified various water savings measures and were subsequently commissioned to carry out work which they did and they now actively monitor water usage. This has resulted in reduced water consumption at various sites, some by a significant amount.

A programme of works to improve energy efficiency at the Stobart Stadium has been completed. Electricity consumption has reduced by 24% (including voltage optimisation equipment and an awareness campaign). The reduction is based on the consumption data from the 6 month period between 1<sup>st</sup> April and 30<sup>th</sup> September.

Carbon management will be a feature of the Building Schools for the Future Programme. At the present time the intention is to refurbish buildings to a BREEAM standard (good) and targets have been set for each school in respect of renewable energy provision. However, experience from other authorities has shown that schools built under the BSF programme typically increase their electricity consumption through the increased use of IT equipment and extended hours.

At the Town Hall Runcorn energy efficient measures were incorporated into the new/refurbished building. This included increased insulation at roof level, double glazed window units, cladding and solar shading to stop excessive solar gain in the summer (negating the need for air conditioning), photovoltaic panels (that convert sunlight into electricity which is then connected into the building power supply), voltage optimising equipment, daylight sensory lighting and energy saving lights, upgrade to the heating and boiler system including heating zoning areas to allow heating to be turned off in areas when not in use. Central kitchenettes are provided with water boilers/ chilled water/fridges and microwaves in order to remove the general need for fridges and kettles within the office environment. The toilets are fitted with energy efficient hand dryers and push taps. Energy consumption is estimated to reduce 14%.

When buildings are refurbished Property Services look at the potential for introducing as much energy efficient technology as possible but the Panel felt that Runcorn Town Hall should not be seen as a one-off project but the model for future building refurbishments.

In addition to the above initiatives the Council has an ongoing maintenance programme which enables various energy efficient schemes to be

implemented across the Council's Property Portfolio e.g. roof insulation, double glazing and boiler replacement schemes.

The Council has made good progress in implementing initiatives, however, the lack of a structured programme of energy audits and monitoring data was impacting on the Council's ability to implant a more rigours and proactive approach to energy management. Liverpool and Knowsley have recognised the benefits of such an approach and are proactive in identifying energy hot spots and implementing measures to reduce consumption. The Panel recognised this would require a specific financial resource.

## **7.8 Information Technology**

ICT is a major use of energy and natural resources. The Garner Group estimate that the ICT Sector is responsible for about 2% of national carbon emissions. The Carbon Trust estimates that office equipment now accounts for about 15% of total energy use in the UK. This figure is set to rise to 30% by 2020.

Every new computer server, PC or printer and mobile device the Council uses needs power and a vast infrastructure to support them e.g. application servers storage back up systems via the wireless communications network, anti virus servers, internet firewalls, e-mail servers and web servers which all rely on a continuous supply of electricity. A responsible green ICT system can play a significant role in reducing carbon emissions whilst, at the same time, allowing people to work more flexibly. Current initiatives within ICT to reduce emissions include:

- Switching from tube monitors to flat screens (which use around 50% less energy).
- The introduction of multi-functional devices has reduced the need for desk jet and ink jet printers, which are less environmentally friendly and reduce the number of printers within the Council.
- Virtualisation allows ICT services to consolidate the number of servers and decrease operational costs through less physical equipment that need less power to run and cool. ICT services have been working with external suppliers to virtualise a number of servers.

Data centres are a large user of power. The data server room at the Municipal Building was noted by the Council as being a particular high consumer of energy. An energy profiling exercise was undertaken and it was noted that the electrical base load is in the region of 80% of the total load which is obviously a significant amount (the building has an electrical loading of 3,600 kWh Monday to Friday and the associated base loading is 2,800 kWh). The IT Data Server was subsequently sub-metered in an attempt to quantify how much this area contributes to the overall base load. It was noted that the energy



consumed within this area was indeed 65% of the overall base load. This was partly due to the night and weekend load.

As the server room contains IT equipment that needs to be running constantly the opportunities for energy reduction of associated equipment will be restricted somewhat. Also the room air conditioning equipment will be utilised on a constant basis as the heat loads emitted by the PC equipment will constantly require cooling. A recent survey conducted by the Carbon Trust had identified a seven point action plan that included changes to the cooling units, fan controls and in rack stacking. The report highlighted that the Plan would cost approximately £33,000 to implement but could achieve £18,000 per annum, a pay back of 1.7 years. There was also scope to examine whether the night load from the server room could be reduced.

The role of ICT can be much wider than just reducing its own emissions. Several reports have pointed out that the use of ICT has the potential to reduce carbon emissions by far more than ICT's direct contributions. For example, ICT can facilitate the use of video conferencing virtual conferencing and all flexible home working arrangements. If these measures were to be pursued the Council would need to ensure that the savings in transport actually compensated for the increase in IT

## **7.9 Use of Electrical Equipment**

The Group identified that as part of the refurbishment of Runcorn Town Hall break-out facilities had been provided with constant hot and cold water, microwaves and fridges. Zonal heating and improvements to boiler controls had been introduced alongside shading equipment which cooled the building down in the hotter months. As a result, employees did not need individual kettles, microwaves and fridges and heating and air conditioning units. This has the potential to reduce consumption at the building from the use of personal items and reduce the night base load at the building. In other buildings there are no controls on the use of electrical items although alternative facilities are often not available. The Group felt that the model adopted at Runcorn Town Hall should be used for other refurbishments and the aim should be to remove personal electrical items. The Group noted that often each office has their own equipment which contributes to an increase in consumption. There is scope in the meantime to reduce the number of electrical items by offices sharing equipment, and this could be promoted through the Green Champion Network.

## **7.10 Schools**

Energy consumption in schools accounted for approximately 60% of the carbon emissions from buildings. To date progress in involving schools has been minimal, except for considering opportunities to introduce energy efficiency measures as part of the Building Schools for the Future Programme and the Capital Pot.

As part of the multi site audit four primary schools and a secondary school had been included and the findings when available would provide information specific to the four schools but which could potentially be shared with others.

The Group also heard that the Council had identified four primary schools and a secondary school to work with to explore the benefits of the Eco School Programme. This is due to take place over the coming months and once the pilot has been evaluated consideration will be given to rolling the programme out to other schools.

Durham Council has around 250 schools. It has already carried out improvements to lighting and the building fabric of most of its schools, and in 2010 is starting a major programme to support behaviour change in all of its schools. To do this, the Council is employing 3 Carbon Reduction Officers to work with headteachers and staff on training, awareness-raising and integrating energy conservation into the curriculum, as well as developing specific energy efficiency projects. Funding for the posts will come from the overall schools energy budget with savings returned to that budget. The Carbon Reduction Officers will be supported by the Energy Team on technical issues.

Rochdale Borough Council has 74 schools. In 2002 they allocated specific officer time to co-ordinate sustainability activity in schools and promote the Eco-schools programme. A key part of this work was to set up the Rochdale Education for Sustainability Network – a network of RMBC staff, teachers and school staff and external agencies such as Groundwork – to work together to run projects, provide resources and share advice and information. In 5 years the network helped to increase the number of Eco-schools from 7 to 68, including one permanent Green Flag school, and the Council continues to support the network with 1-2 days/week of officer time.

### **7.11 Energy Fund**

The Panel heard that the overall maintenance budget is circa £2.5m, approximately £1.1m of which is available for programmed maintenance work. There are no real energy efficient projects undertaken out of this pot, however projects such as re-roofing, new windows, and new boilers do help the energy efficiency programme. There is also no assessment undertaken of the energy savings made from the work undertaken.

Projects included in the Carbon Management Plan have been primarily funded from the Council's Invest to Save budget (Stobart Stadium Power Perfectors, and MFDs). However, this is not ring fenced for carbon/energy purposes and as such the Council is not able to draw up a rolling programme of energy improvement across its portfolio but tries to introduce measures as and when building refurbishment takes place or specific projects are identified.

The multi-site audit of a number of buildings would help the Council develop a long term programme of energy efficient measures but would require some financial investment.

The Panel was advised that a number of Councils had set up Energy Recycling Funds as an Invest to Save Initiative. Many of these have used Salix Finance. This is a mechanism, managed by the Carbon Trust, to provide 50% funding for energy saving projects that meet strict payback criteria. The Council must set up a ring-fenced fund into which the cost savings are paid over an agreed timescale, thus creating a fund for investment in future energy saving projects.

#### Invest to Save Examples

Stockport Council set up a 3-year Invest to Save scheme in 2006/7 with £50,000/year from Salix and £50,000/year internal finance (i.e. £300,000 total over 3 years). Stockport's Salix programme has now ended and they are now proposing a ring-fenced fund for investment in carbon reduction projects based on their maximum liability for the Carbon Reduction Commitment – i.e. how much it would cost if they were to finish bottom of the table each year for 5 years.

Knowsley MBC dedicated team have access to an energy fund of £200,000 which is used to fund energy reduction projects identified from the audits. The savings in consumption are paid back by the responsible department and recycled back into the energy fund. The fund has been used mainly for small projects such as boiler controls, lighting controls etc.

Lancaster City Council (a district authority) has set aside £100,000 for energy efficiency projects over 5 years (£20k/year). Following a Carbon Trust audit, this has been invested in a range of measures at the leisure centre (pool covers, variable speed drives, lighting controls) power factor correction and a small budget to support the Bright Sparx green champions.

Gateshead Council has set up an Invest to Save scheme of £650,000, part-funded by Salix, for a range of energy efficiency projects. They are also using prudential borrowing for a £2.75m street-lighting upgrade programme. Through these measures, Gateshead are aiming to achieve a 35% reduction in CO2 emissions in 5 years.

Caerphilly Borough Council was awarded a Salix fund of £300,000 which was topped by the local authority with £500,000. With a dedicated team of 4 staff from their energy department to develop projects and manage the funds, they have achieved savings such as a 40% reduction in sports hall electricity consumption.

Leicester City Council was awarded Beacon Council status for 2005 -2006 for its work on sustainable energy. The invest to save scheme here is slightly different in that savings made go back to the users of the building. The Council's energy management section monitors energy consumption in all buildings and targets investment towards those areas where greatest financial savings can be achieved by building users. This has led to lower overheads and savings each year of £40,000 in running costs, which can be used to further improve services.

The Panel felt that that the creation of an Energy Fund would strength the Council's approach and ability to reduce consumption. Any fund would require some form of criteria to evaluate schemes and ensure that paybacks were no longer than 5 years. The Panel thought that as part of the 2010/11 budget process consideration should be given to establishing an Energy Fund to support a programme of initiatives, initially based on the findings of the Carbon Trust Multi Site Audit. In considering the establishment of a fund the feasibility of linking it to a Salix application should be considered. The potential to use the fund to reduce liability for the Carbon Reduction Commitment should also be considered in identifying the size of the budget available.

## **7.12 Staff Awareness**

The Council employs approximately 3,000 people in a variety of office based and front line jobs. As such the Council has the potential to make a significant impact in reducing consumption from its buildings by involving staff in energy awareness campaigns. Through the Invest to Save initiative the Council has operated a Staff Awareness Campaign to promote energy efficiency, provide advice and information to staff on good energy efficient practices they can adopt to save energy. The Carbon Trust estimates that a 5 – 15% saving in energy costs can be achieved from good housekeeping.

The Council has established and trained a Green Champion Network to encourage other staff to be more proactive about energy saving practices. The Network has been supported by the production of a Green Office Guide and regular articles are also included in the Council's Core Brief and In Touch Magazines. The Green Champion Network currently only extends to four buildings (Municipal Building, Rutland House, Halton Lea Library and the Stadium).

The Panel heard that measuring the impact of the Green Network and the awareness campaign has been difficult to establish, but this issue is common to all organisations. Sustaining the momentum of the Network is key to its effectiveness.

The Panel heard that the Stobart Stadium management have developed a proactive approach to staff engagement following a Carbon Trust audit of the building. In addition to the good housekeeping approaches adopted by the Stadium, a number of technical measures have been implemented. The Panel received evidence that indicated that involving the staff reduced consumption by 12% and the technical measures achieved a further reduction of 15%. In the trading year 2009/2010 the real financial cost saving to the Stadium was £39,000 and a reduction in consumption of 388, 491 KWh.

The Stadium Manager has established a staff team to look at energy savings initiatives. The team introduced the following practices:

adopted an Energy Mission Statement,

formal training was undertaken with staff on good housekeeping techniques and information cascaded to all areas and grades including casual and agency staff. A table of energy usage comparing year on year usage is produced each month and shared with staff.

identified a range of opportunities for saving energy through good housekeeping.

appointed individuals to carry out energy audit walkabouts and report back to the Group on the range/level of equipment left on when not in use,

introduced a “switch off campaign”,

put up promotional energy saving literature from the Carbon Trust Web Site around the building.

action was then followed up with individual managers/members of staff. The Group meets monthly and monitors electricity and gas consumption figures.

These measures could be implemented across the Council at little or no cost but needed buy in from senior managers with individual managers taking responsibility for energy management and developing energy teams within their service areas.

The Panel felt there had been positive progress in promoting energy efficiency within the Council but further work need to be undertaken to embed energy awareness with all Council services. The model adopted by the Stadium management offered a more robust approach to energy efficiency and if rolled out across the Council with individual service managers given responsibility and targets for reducing consumption could result in further savings. The installation of AMRs would help individual managers monitor performance. The Panel recognised that service manager would need to be supported in good house keeping practice and steps should be taken to develop a short in house training course for managers and staff. The Programme should be initially target at high consuming self managed buildings.

The Council should continue to develop ongoing promotional activity though posters, stickers, e mail and the internet to promote general awareness of the need to save energy. The Council should take advantage of national campaigns such as Energy Awareness Week run by the Energy Saving Trust to run its own internal campaigns. A number of regional organisations offer employee awareness training which focuses on energy use in the home, but has shown to benefit behaviour at work. The Council should look at the potential to incorporate this into its workplace training programme.

A presence should be established on the intranet where employees and members can access useful information on energy efficiency.

### **7.13 Whole Life Costing**

Whole-life cost refers to the total cost of ownership over the life of an asset.

Whole-life cost is most commonly used for:

- option evaluation when procuring new assets,
- decision-making to minimise whole-life costs throughout the life of an asset,
- comparison of actual costs for similar asset types,
- as feedback into future design and acquisition decisions.

The primary benefit of whole-life costing is that costs which occur after an asset has been constructed or acquired, such as for maintenance, operation and disposal, become an important consideration in decision-making. Previously, the focus has been on the up-front capital costs of creation or acquisition, and organisations may have failed to take account of the longer-term costs of an asset. It allows an analysis of business function interrelationships. Low development costs may lead to high maintenance or customer service costs in the future.

The Panel heard that the Stadium management had used this approach for the recent purchase of equipment. As part of the tendering exercise information on the energy and water usage figures for equipment were requested. In evaluating the tenders it was found that when taking in to account the energy running cost, equipment that had a higher up front cost was more cost effective and resulted in a saving of approximately £1,800. The Group felt that if this approach was replicated for other purchases it could lead to longer term savings for the Council. The Group felt that the use of whole life costing should be explored further with the Procurement Unit and a further report be prepared on the practicalities of introducing the approach into other tendering approaches.

### **7.14 Renewable Energy**

Renewable energy technologies like wind turbines, solar panels and biomass heaters offer an alternative to fossil fuels and can help reduce an organisation's CO<sub>2</sub> emissions.

From April 2010, Feed-in Tariffs will be introduced for small-scale renewable electricity generation, offering the potential for long-term income for the Council. The scheme guarantees a minimum payment for all electricity generated by the system for a period of between 20-25 years, as well as a separate payment for the electricity exported to grid. These payments are in

addition to the bill savings made by using the electricity generated on-site. The amount offered is fixed at the point at which the technology is installed, but is expected to reduce over time, so the sooner a system is installed, the greater will be the guaranteed income.

A similar scheme for renewable heat is due to be introduced in April 2011 – the Renewable Heat Incentive (RHI). Full details of the FITs and RHI are given in Appendix 1.

In 2008 the Council had entered into an Agreement with Partnership for Renewables. to bulk screen Halton for possible sites for wind turbines. Initially nine possible sites were identified. This has been further narrowed down to two but these were not explored further as they were considered to be financially unviable. To date the exploration of the use of renewable energy at Council buildings has been limited but there have been some discussions as to the potential for introducing new renewable technology, particularly CHP and biomass within the Building Schools for the Future Project.

Research indicates that the ability of renewable energy sources to generate sufficient electricity and a reasonable cost are the main barriers to the implementation of schemes. However, the introduction of FIT potentially makes the use of renewable technology more financially viable. The Group heard that renewable projects may be more viable if the Council was part of a consortium involving other partner organisations on the LSP that could share the costs and electricity generated.

The Council has no specific targets for introducing renewable energy sources into its Building Portfolio and there is no written policy for purchasing green electricity although a proportion of the current contract allows the Council to purchase green energy.

The Group felt that further options for undertaking a further feasibility study should be undertaken in the light of the introduction of FIT

## **7.15 External Funding**

There are currently a range of external funding opportunities to support the introduction of energy efficient measures.

Department of Trade and Industry's Low Carbon Buildings Programme (LCBP) - Phase 2 Grants are available to not-for-profit organisations seeking to install microgeneration technologies. Technologies currently supported include:

- Solar water heating
- Ground/water/air source heat pumps
- Biomass (including biomass boilers and room heaters/stoves)
- Micro combined heat and power (including fuel cells)

Since the announcement of the Feed-In Tariffs, (FITs) LCBP has been suspended for electricity technologies. Organisations in receipt of any government grant funding for renewable electricity are being advised that if they wish to claim the FITs they will be required to pay back the grant money. This situation has not been fully confirmed for all funding sources, but is expected to definitely apply to the LCBP. It is expected that a similar requirement will apply to any renewable heat projects funded under the LCBP once the Renewable Heat incentive is confirmed.

Salix is an independent company funded by The Carbon Trust to work with the public sector to reduce carbon emissions. By combining grant funding and its expertise Salix gives organisations an opportunity to improve energy efficiencies and reduce energy costs as well as taking a leadership role in tackling climate change. To date, the Council has only secured an interest-free loan from Salix for the installation of Power Perfectors.

Low Carbon Building Design Advice Service offers professional, independent and objective advice on energy efficient and environmentally conscious design of buildings. The Service offers free-of-charge consultancy (up to ten days) to assist building procurers to adopt and embed a low carbon ethos.

Pilkington Energy Efficiency Trust provides funding for research projects whose successful completion is likely to result in the more efficient use of energy in new or existing buildings. Although there is no upper limit on grants awards rarely exceed £20,000.

Part of the Competitiveness and Innovation Programme (CIP), funding is to provide for the promotion of energy efficiency and for increasing investments in renewable energy. The total budget is €727million. Halton already have one bid in to this funding stream.

The Panel felt that the Council was not fully investigating the potential to secure external funding for existing projects and in the future as part of the development of any energy efficiency initiatives, an assessment should be undertaken, in conjunction with the External Funding division to assess whether external funding could be applied for.



## Appendix 1 Feed In Tariffs and the Renewable Heat Incentive

Feed-in Tariffs (FITs) will be introduced to Great Britain on 1st April 2010. The scheme requires energy suppliers to make regular payments to householders and communities who generate their own electricity from renewable or low carbon sources such as solar electricity (PV) panels or wind turbines.

The scheme guarantees a minimum payment for all electricity generated by the system, as well as a separate payment for the electricity exported to grid. These payments are in addition to the bill savings made by using the electricity generated on-site. The scheme covers the following electricity-generating technologies, up to 5 Mega Watts:

- Solar electricity (PV) (roof mounted or stand alone)
- Wind turbine (building mounted or free standing)
- Hydroelectricity
- Anaerobic digestion
- Micro combined heat and power (MCHP) (limited to a pilot at this stage)

The tariffs available and the process for receiving them vary, depending on when the technology was installed, and whether the system and the installer were certificated

If an organisation is able to receive the FIT they can benefit in 3 ways:

1. **Generation tariff** – a set rate paid by the energy supplier for each unit (or kWh) of electricity you generate. This rate will change each year for new entrants to the scheme (except for the first 2 years), but once you join you will continue on the same tariff for 20 years, or 25 years in the case of solar electricity (PV).
2. **Export tariff** - you will receive a further 3p/kWh from your energy supplier for each unit you export back to the electricity grid, that is when it isn't used on site. The export rate is the same for all technologies.
3. **Energy bill savings** – you will be making savings on your electricity bills , because generating electricity to power your appliances means you don't have to buy as much electricity from your energy supplier. The amount you save will vary depending how much of the electricity you use on site.

You will require an additional electricity meter to measure the electricity that your system is generating, and also to measure how much is being fed back into the electricity grid.

Once you have installed your generating technology you must inform your chosen energy supplier that you are eligible to receive the FIT. The supplier

will then register your installation onto the Central FIT Register, which is administered by Ofgem. Payments will be made by your energy supplier at intervals to be decided between you and your supplier. You may be required to provide meter readings to the suppliers if requested.

If you want to opt out of the guaranteed export tariff you must inform the supplier. You may want to do this if you chose to use a power purchase agreement.

The tariff levels for the electricity financial incentives (pence), calculated to offer between 5-8% return on initial investment in the technology are:

Tariff levels for electricity financial incentives

		Year 1: 1.04.10- 31.03.11	Year 2: 1.04.11- 31.02.12	Year 3: 1.04.12- 31.03.12	Tariff lifetime (years)
Anaerobic digestion	≤500kW	11.5	11.5	11.5	20
Anaerobic digestion	>500kW	9.0	9.0	9.0	20
Hydro	≤15 kW	19.9	19.9	19.9	20
Hydro	>15 - 100kW	17.8	17.8	17.8	20
Hydro	>100kW - 2MW	11.0	11.0	11.0	20
Hydro	>2kW - 5MW	4.5	4.5	4.5	20
MicroCHP pilot*	≤2 kW*	10*	10*	10*	10*
PV	≤4 kW (new build)	36.1	36.1	33.0	25
PV	≤4 kW (retrofit)	41.3	41.3	37.8	25
PV	>4-10kW	36.1	36.1	33.0	25
PV	>10 - 100kW	31.4	31.4	28.7	25
PV	>100kW - 5MW	29.3	29.3	26.8	25
PV	Standalone system	29.3	29.3	26.8	25
Wind	≤1.5kW	34.5	34.5	32.6	20
Wind	>1.5 - 15kW	26.7	26.7	25.5	20
Wind	>15 - 100kW	24.1	24.1	23.0	20
Wind	>100 - 500kW	18.8	18.8	18.8	20
Wind	>500kW - 1.5MW	9.4	9.4	9.4	20
Wind	>1.5MW - 5MW	4.5	4.5	4.5	20
Existing microgenerators transferred from the RO		9.0	9.0	9.0	to 2027

\*NB This tariff is available only for 30,000 microCHP installations. A review will take place when 12,000 units have been installed.

<b>Tariff levels for Renewable Heat Incentives</b>			
<b>Technology</b>	<b>Scale</b>	<b>Tariffs (pence/kWh)</b>	<b>Tariff lifetime (years)</b>
<b>Small installations</b>			
Solid biomass	Up to 45kW	9	15
Biodiesel	Up to 45kW	6.5	15
Biogas on-site combustion	Up to 45kW	5.5	10
Ground source heat pumps	Up to 45kW	7	23
Air source heat pumps	Up to 45kW	7.5	18
Solar thermal	Up to 20kW	18	20
<b>Medium installations</b>			
Solid biomass	45kW-500kW	6.5	15
Biogas on-site combustion	45kW-200kW	5.5	10
Ground source heat pumps	45kW-350kW	5.5	20
Air source heat pumps	45kW-350kW	2	20
Solar thermal	20kW-100kW	17	20
<b>Large installations</b>			
Solid biomass	500kW and above	1.6 -2.5	15
Ground source heat pumps	350kW and above	1.5	20
Biomethane injection	All scales	4	15