



## West Midlands Property Alliance

## Low Carbon Management Programme

July 2014

## Report information

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**Client:** Improvement and Efficiency West Midlands (IEWM)

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### About Sustainability West Midlands

We are the sustainability advisers for the leaders of the West Midlands. We are also the regional sustainability champion body for the West Midlands, designated by government. We are a not-for-profit company that works with our members in the business, public and voluntary sectors. Our Board is well led and has cross-sector representation; they are supported by our team of staff and associates.

Our vision is that by 2020 businesses and communities are thriving in a West Midlands that is environmentally sustainable and socially just.

Our role is to act as a catalyst for change through our advice to leaders, to develop practical solutions with our members and share success through our communications.

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## Foreword

As Chief Executive of Coventry Council, I am acutely aware of the huge challenges facing local authorities in these difficult economic times. Councils face increasing pressures to focus on key service and financial priorities but it is critical that we continue to recognise that our approach to carbon management remains a key priority across the West Midlands. Consequently, the West Midlands Property Alliance (WMPA) placed the low carbon programme as one of its core priorities.

We must continue to lead the way, encourage and promote new ways of working; together with modern design and construction of “fit for purpose” energy efficient buildings, infrastructure, housing, industry, vehicles and transport and to support colleagues to become more aware of carbon management in day to day operations. Working together we can make a significant contribution towards reducing our national long-term emissions (including greenhouse gases and carbon emissions) target by 80%, to get these below 1990 levels by 2050.

Much of our asset base has suffered from under investment and much of our estate requires significant investment to bring them to modern day energy efficient standards. Inevitably facing such a huge challenge will require closer work with other public and private sector partners in order to reduce costs and provide more efficient customer focussed and joined up pan public services.

The 33 West Midlands Councils spend over £100 million per annum on electricity, gas and water, not an insignificant sum and one which the WMPA wanted to explore if there was potential to reduce this. This challenge, together with our wider community leadership role in working with our other partners to reduce our carbon footprint and create “green” jobs in sectors such as housing, waste, construction, vehicles and transport will not only provide significant opportunities but also demonstrate that the West Midlands is at the forefront of the sustainable low carbon agenda. The WMPA and Sustainability West Midlands have worked in partnership over the last three years on the Low Carbon programme and this report represents a summary of what has delivered.

I have chaired the West Midlands Property Alliance (WMPA) since its formation in 2010 and been a Board Member at Sustainability West Midlands for several years and so I’m extremely pleased to have been actively involved and contributed to the success achieved to date. The Low Carbon programme is a forerunner nationally and the results clearly highlight the benefits of what can be delivered by working together.

The achievements to date are the evidence of the commitment and enthusiasm shown by individuals and councils and their ongoing collaboration that would not have been achieved if the WMPA had not existed. I would like to thank all those who have contributed towards the success of the programme and their contribution to this report.



*Martin Reeves*

**Martin Reeves**  
Chief Executive, Coventry City Council  
IEWM Board Member  
Chair of the WMPA  
Sustainability West Midlands Board Member

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## 1. The report

As a result of financial austerity pressures, local authorities need to identify considerable budget savings. The challenge is to explore opportunities to work with partners and the private sector to bring costs and energy consumption down and deliver services more efficiently and effectively.

Formed in 2010, the West Midlands Property Alliance (WMPA) has led the way in co-ordinating a programme of projects and activities that have delivered over £3.2 million of efficiency savings and are on target to deliver a 10 year savings programme of £173 million together with CO<sub>2</sub> reductions of 55,000 tonnes per annum. The WMPA and SWM have provided leadership, commitment and support to the ongoing development of a proactive network to represent the low carbon economy sector at strategic and operational levels, share and showcase best practice and to work collaboratively to explore carbon and energy reduction.

Chaired by Martin Reeves, Chief Executive of Coventry City Council and Improvement and Efficiency West Midlands (IEWM) Board Member, the WMPA supported councils across the West Midlands to deliver this impressive programme. The IEWM sponsored Low Carbon Management Programme has invested nearly £0.4m to support many of the projects showcased within this report. This report highlights yearly efficiency savings of £3.2m to date from a wide variety of innovative projects.

IEWM are extremely grateful for the contributions to the success of the programme and the case studies within this report. It has been produced to celebrate and share the success of the low carbon programme with colleagues regionally and nationally and to encourage you to take up the opportunities identified within your own councils.

A handwritten signature in black ink that reads "Keith Gordon". The signature is written in a cursive style with a horizontal line underneath the name.

**Keith Gordon**

Former Assistant Director for Efficiency and Delivery,  
Improvement and Efficiency West Midlands

## 2. The Challenge

Local authorities and their partners are facing unprecedented cost savings measures, rising energy bills and taxes, and shrinking public sector employment, whilst also trying to capitalise on the emerging opportunities from the low carbon economy.

Spending on energy is one of the largest controllable overheads in local authority buildings with over £100 million spent each year on electricity, water and gas and therefore it presents a significant opportunity to make savings.

As well as the financial savings that can be achieved by reducing energy consumption, wider social impacts can include improved working environments, increased staff productivity and a clear demonstration to corporate, social responsibility. This in turn can have a positive impact on the public perception of Councils as leading the way in sustainable and “green” ways of working.

Local authorities can have a wide sphere of influence with their activities including management of their own and public buildings, housing, transport, street lighting and waste services. Carbon savings can be achieved through the effective and efficient management of these service areas.

The low carbon work stream of the West Midlands Property Alliance was established with the aim of encouraging carbon savings via practical support to local authorities within the West Midlands. Sustainability West Midlands were engaged by Improvement and Efficiency West Midlands in 2011 to deliver the programme of support with funding of less than £0.4m. As a result of this investment financial savings of over £3.2m per year are anticipated by local authorities in the West Midlands.

The programme focused on three key objectives:

- Identify opportunities to reduce energy costs and carbon emissions within local authority and public sector buildings – through benchmarking and energy audits.
- Support implementation to realise opportunities to reduce energy costs and carbon emissions within local authority and public sector buildings – through implementation support, behavioural change programmes, combined heat and power (CHP) and district heating schemes, small scale capital infrastructure projects and alternative financing models.
- Share good practice to maximise the impact of the programme to all local authorities and public sector estate managers in the West Midlands and lever in more national funding opportunities – through the development of the regional Energy Managers Network together with enhanced communication to share best practice.

This report concentrates on each of these three priorities in some detail together with supporting case study examples.

### 3. Measuring the benefits

In order to understand the potential for local authority savings on energy it is important to understand where energy is being used. Often the greatest potential for saving may not be obvious. Energy use can be analysed by reviewing energy invoices over an annual period in order to establish a picture of monthly performance. Larger local authority buildings often have meters recording half-hourly electricity consumption and this data should be available from the energy supplier for comparison with bills. However, if the building does not have a half hourly electricity meter, monthly meter readings can be manually taken. Gas consumption should be monitored in the same way.

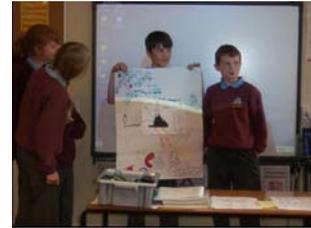
IEWM have funded energy audits for local authorities within the West Midlands. The audits were undertaken between 2010 and 2013 by a specialist consultant. Through analysis of bills and meter readings, and visual observations within authority buildings, the audits identified that over £3 million could be saved by local authorities on gas, electricity and water bills as a result of:

- Making changes to the way that energy is purchased
- Ensuring that local authorities are on the most appropriate tariff according to their profile of energy use
- Introducing effective behavioural change campaigns to alter patterns of energy use and reduce consumption
- Installing energy efficient technologies such as LED lighting, automatic meter readers (AMRs) and passive infrared sensors (PIRs) to reduce energy consumption at source

The energy audits allowed local authorities to identify many quick and relatively cheap ways of reducing the cost of energy. From the investment in energy audits of approximately £75,000 it is anticipated that over £3 million per annum will have been saved on energy bills by local authorities in the West Midlands by March 2015.

## **CASE STUDY**

### **SOLIHULL METROPOLITAN BOROUGH COUNCIL – USING ENERGY AUDIT TO DRIVE CHANGE**



#### **Background**

*Solihull Metropolitan Borough Council had an energy and water audit undertaken in 2011. The audit focused on key sites owned by the Council and identified that £24,500 per year and 200 tonnes of CO<sub>2</sub> could be saved as a result of making behavioural changes alongside the implementation of energy efficient technology such as LED lighting and lighting controls. Solihull MBC estimated that 10% of their energy costs could be saved as a result of behavioural change. They had Director level support for a behavioural change campaign and also had access to data from AMRs so that energy savings could be quantified.*

#### **Current status**

*The audit in 2011 assisted the Council to prioritise areas for action and so employees at schools and public buildings were targeted with the behavioural change campaign in association with the Carbon Trust.*

*The Carbon Schools Programme was established as a way of engaging with all schools in the borough over three years with a target of reducing emissions of CO<sub>2</sub> by 24% over this period. The Council worked with the schools to take control of heating and lighting, understand renewable energy, reduce out-of-hours electricity use, and develop curriculum activities. The programme has effectively reduced gas and electricity consumption at the majority of the thirteen schools included in the first year of the programme.*

*A similar programme was introduced for corporate buildings. The Corporate Carbon Programme aims to achieve carbon reduction through fast-track opportunities, operational and investment measures. The target is a reduction in costs and carbon of 25% over a five year programme. Again, the Council is engaging with property managers and other key staff to identify simple or low cost measures that could be implemented to reduce energy consumption. This is starting to show results with reduced gas and electricity consumption at corporate properties.*

#### **Lessons learnt**

- *An initial benchmark and access to automatic meter reading (AMR) data allowed the Council to measure the impact of behavioural change programmes*
- *By prioritising activity at high energy-using sites, the Council were able to reduce energy consumption over a fairly short period and achieve measurable cost and carbon savings*
- *By rolling the programmes out in phases the Council can learn from good practice and make changes where necessary*

## 4. Benchmarking performance

To assess progress and performance in addressing climate change and the low carbon economy it is useful to undertake benchmarking. This can allow an organisation to determine their starting point and then measure increased or decreased levels of activity and performance. This can be useful as an internal measure and when several organisations take part, it can be an effective way of measuring performance against other similar bodies.

With funding from IEWM, SWM have developed and used a good practice benchmarking framework with all 33 local authorities in the West Midlands. Benchmarking has been completed in 2013, 2012 and 2010 providing robust evidence on which to report.

The benchmark addresses three core areas; climate change mitigation, climate change adaptation and promotion and stimulation of a low carbon economy. Various criteria are assessed under each category and for each criterion local authorities are asked to select a score between 0 and 3 where:

- 0. indicates 'No Progress'
- 1. indicates 'Getting Started'
- 2. indicates 'Good Practice'
- 3. indicates 'Leading Practice'

The results reported each year are shown in Figure 1.

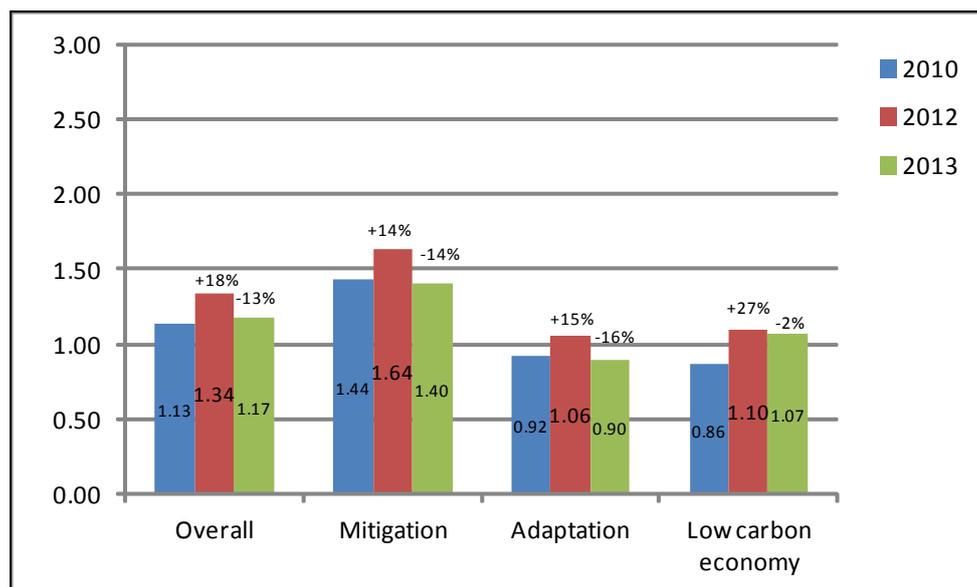


Figure 1: Average scores

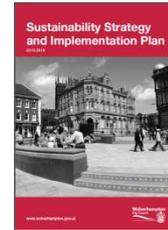
The results indicate a positive picture showing that most local authorities feel that they are somewhere between 'getting started' and 'good practice' with regard to actions to address climate change. However, it also shows that progress has not increased significantly over the three years,

highlighting that low carbon, whilst regarded as a key long term priority, has been preceded by other priorities such as “balancing the books”, social care and education.

Each local authority within the West Midlands has been provided with a report from SWM showcasing their good practice and highlighting areas which should be given priority. SWM have met with corporate management teams at individual authorities. The reports were universally well received. The feedback indicated that having an independent report of their progress has helped them take stock and refocus to push forwards with activities related to climate change and the low carbon economy and raise the profile of the type of projects identified within this report.

## **CASE STUDY**

### **WOLVERHAMPTON CITY COUNCIL – USE OF BENCHMARK**



#### **Background**

*Wolverhampton City Council have taken part in the benchmarking exercise since 2010 giving three years of data and allowing the Council and SWM to understand progress by the Council in tackling climate change mitigation and adaptation, and promotion of the low carbon economy.*

#### **Current status**

*The results provided by Wolverhampton City Council show that significant progress has been made in promoting the low carbon economy and in addressing adaptation to climate change within the area. The benchmark demonstrated that activity in addressing climate change mitigation had fallen between 2012 and 2013, largely due to limited resources at the authority. However, significant progress has been made by the publication of the 'Sustainability Strategy & Implementation Plan 2013-18'.*

*The benchmark report was sent to the Chief Executive along with various officers and has highlighted the importance of sustainability issues at a critical time for the council and contributed to a review of the effectiveness of current arrangements. SWM were invited by the Council to attend their Sustainability Advisory Group which is attended by councillors including the Leader of the Council. We also attended a meeting of the Sustainability Delivery Group involving officers from various departments.*

*By communicating the results of the benchmarking to a range of individuals at the Council we have raised awareness of good practice but also highlighted activities that need to be given priority.*

#### **Lessons learnt**

- *By completing the benchmark on an annual basis the Council can clearly demonstrate progress in relation to climate change mitigation, adaptation and promotion of the low carbon economy*
- *The independent view of SWM when sharing the results of the benchmark with the Chief Executive of the Council, along with elected members and officers from different departments is an effective way of encouraging activity and actions*

## 5. Making changes

### 5.1 Behavioural change

One of the most cost effective ways of reducing energy use is behavioural changes made by the occupants of a building, e.g. turning lights and computers off at night. Behaviour change has long been recognised as a low-cost, high-impact way of reducing an organisation's costs. To ensure that changes to behaviour are successful, all staff need to be committed to energy efficiency. Staff should be made aware of areas where energy is wasted and trained to use equipment and controls efficiently. Those Councils that have "appointed" energy champions have been particularly successful in reducing energy bills.

Behavioural change has been integral to the success of the IEWM low carbon work stream. Once energy audits had been completed local authorities were given support in developing behavioural change programmes specific to their needs.

Workshops have been held for local authority officers in order to share good practice regarding behavioural change and reduced energy use.

IEWM and SWM will continue to work together to ensure that local authorities go on promoting behavioural change as a key means of reducing energy consumption. This may include an annual behavioural change conference for public sector organisations along with the development of standardised tools for use by authorities within the region.

## CASE STUDY

### COVENTRY CITY COUNCIL – BEHAVIOURAL CHANGE TO REDUCE ENERGY USE



#### **Background**

Coventry City Council aim to embed carbon management through behavioural change in their corporate culture by inclusion in job descriptions and associated performance management. Staff are also provided with training and information regarding energy management.

#### **Current status**

One of the main ways that behavioural change is encouraged within Coventry City Council is via Green Champions. Green Champions is a network of individuals throughout the Council who lead by example and encourage others to reduce our energy use, water and waste, as well as promoting green travel options and using resources wisely. The Green Champions carry out audits of their particular office areas in order to develop action plans. They offer training, support and incentives to colleagues and have an input to communications and campaigns. They also have access to a 'mini fund' which can be used to finance small carbon management projects.

#### **Lessons learnt**

- To change people's behaviour you must make it easy – remove any barriers and make it appealing
- To quantify the impact of behavioural change campaigns it is important to have access to meter readings in particular areas of the building

## 5.2 Financing energy efficiency projects

When considering how to finance low carbon activities locally, local authorities need to consider whether they will be directly funded by the council or whether private sector finance will be required. Local authorities also need to consider whether they need general or specialist funds. Given the financial challenges facing Councils, it will always be difficult to fund up-front capital investment for carbon reduction projects such as lighting, automatic switches and room temperature sensors as typically these have a payback period of around seven years.

To help local authorities in this decision making process, SWM worked with the Energy Saving Trust and other partners to provide capacity building events and online guidance for financial decision makers, lawyers and other officers. This helped to improve awareness of the benefits of installing energy efficiency and renewable energy measures in existing buildings such as energy and cost

savings, and income generation. This included available funding opportunities and providers such as Salix which is an independent, not-for-profit company providing interest-free match funding to the public sector to invest in energy efficiency measures and technologies that will reduce carbon emissions.

The support included a programme of capacity-building events held at locations around the West Midlands in 2011, with follow-up advice and guidance on specific projects provided by the Energy Saving Trust and its partners early in 2012.

The project also included production of a detailed funding guide<sup>1</sup> for local authorities to support renewable energy and energy efficiency projects.

### **5.3 Energy efficient technology**

Once local authorities have addressed operational and behavioural issues to optimise energy efficiency, it can often be cost beneficial to introduce energy efficient technology in order to further reduce energy consumption and carbon emissions.

IEWM provided £172,000 of capital funding to allow four local authorities to install energy efficient technologies where these were identified in the audits as having the potential to result in significant carbon and cost savings. As a result of this investment £56,000 has been saved by the four local authorities in the first year giving a payback period of less than four years.

Each of the four case studies summarised below are great success stories and provide the evidence for others to follow. In each case with a relatively small investment significant benefits are possible. It also demonstrates that the benefit is not restricted to the larger Councils and that projects for District Councils are equally feasible.

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<sup>1</sup> <http://www.sustainabilitywestmidlands.org.uk/wp-content/uploads/Local+Authority+Funding+Guide+FINAL.pdf>

## **CASE STUDY**

### **RUGBY BOROUGH COUNCIL AND INSTALLATION OF LED LIGHTING**



#### **Background**

*Rising energy costs are increasingly a concern for both individuals and organisations. With this in mind Rugby Borough Council worked on a number of successful energy reduction projects over a four year period. The Council recognises both the financial and environmental challenges they are faced with and so have made a firm commitment to their Carbon Management Plan. As part of this process they identified the need for lighting at the Town Hall to be updated. The key objectives of the lighting project were to:*

- *Reduce energy costs associated with lighting*
- *Reduce the Council's carbon footprint*
- *Install emergency lighting to comply with current legislation*
- *Gain the ability to measure energy consumption associated with lighting*

#### **Current status**

*After a tendering process including office trials, Lylux LED lighting from energy management consultancy Ecolight was chosen as the preferred lighting system. Ecolight carried out a detailed survey of the building before designing the new lighting system. In addition Ecolight installed passive infrared (PIR) sensors throughout the building which meant that when rooms were not in use, lights would dim to 20% usage, while lights in corridors have been set to switch off completely when there is no movement. In order to allow for minimal disruption to staff, all work was completed out of hours and at weekends.*

*As a result of the installation of LED lighting at the Town Hall a number of benefits have already been achieved including:*

- *Projected financial savings of more than £18,000 per annum*
- *76% reduction in energy associated with lighting*
- *80% reduction in annual running and maintenance costs*
- *Positive feedback and user satisfaction has significantly improved*

**CASE STUDY Cont.**

**RUGBY BOROUGH COUNCIL AND INSTALLATION OF LED LIGHTING**

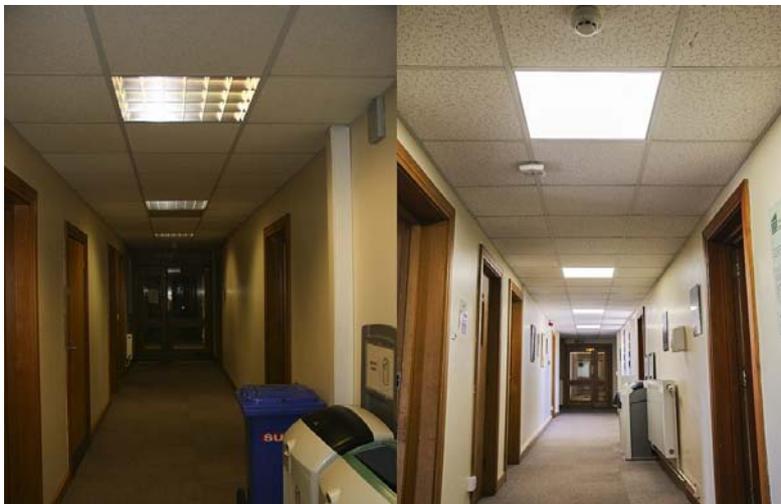
**Lessons learnt**

- *To identify the most cost effective solution for a new lighting system: initially it was thought that the replacement of existing lighting hardware would not be necessary. However it was decided it would be more cost effective to replace the fixtures entirely due to their age*
- *To simplify the process: to avoid complications it would have been beneficial to focus on one individual aspect at a time. For example, keeping the lighting design separate from the emergency lighting design would have simplified the process*

**Rugby images:**

*Before*

*After*



## **CASE STUDY**

### **SOLIHULL METROPOLITAN BOROUGH COUNCIL AND INSTALLATION OF LED LIGHTING**

#### **Background**



*The project involved the replacement of existing old style fluorescent lighting with new energy efficient lighting at three of the Council's multi storey car parks and the central library, located in Solihull town centre. The selection of lighting equipment was important to ensure it was value for money, fit for purpose, and the best market could offer. This helped demonstrate to IEWM the business case to secure funding of £67,000 from IEWM to help finance the project. The aims of the project were to:*

- *Reduce energy consumption and costs at all three car parks*
- *Provide a better and brighter environment within the buildings*
- *Improve the facilities offered to their customers*

#### **Current status**

*This project is already yielding impressive results. During the first year, energy bills have been reduced by approximately £22,000 which reduced the council's Carbon Reduction Commitment liability for that year by over £1,500. If these levels of saving continue, it is anticipated that the payback period will be just over three years. There has been a corresponding reduction in CO<sub>2</sub> emissions of approximately 125 tonnes.*

*There has been a noticeable improvement in the lighting levels at the car parks, which makes the buildings more welcoming and safer for users.*

*Solihull MBC will continue to explore potential opportunities to introduce new lighting systems, such as LED lighting, in order to enhance the internal environment of the council's buildings, for the benefit of service users and to contribute to the council's carbon emissions reduction target.*

#### **Lessons learnt**

- *The project has highlighted the importance of being able to monitor consumption before and after undertaking projects. Obtaining detailed information prior to projects enables a baseline to be set and provided relevant information to develop a business case.*
- *Consumption data used for this project was obtained from the Council's half hourly and AMR data. If they repeated the project again, they would look to obtain more detailed consumption information relating specifically to the lighting circuits rather than the whole electricity supply for the car park.*
- *The Council's long term partnering arrangement with the Dodd Group has contributed significantly to the success of this project and has enabled the council to access suppliers and designers through the Dodd Group's supply chain, and so enabling implementation of the best lighting solution.*

## **CASE STUDY**

### **NEWCASTLE UNDER LYME BOROUGH COUNCIL – INSTALLATION OF ENERGY SAVING LIGHTING, AMRs, AND CAVITY WALL INSULATION**



#### **Background**

*Newcastle under Lyme Borough Council has made a commitment to tackle climate change and reduce CO<sub>2</sub> emissions by at least 30% by 2015. In the last four years, the council has seen an increase in its gas bill of 151% and its electricity bill rose by 165%. At any time, such an increase in expenditure is a major strain on a council's budget, but at a time when economic pressures force the need to evaluate outgoings, the importance of reducing consumption becomes ever more vital.*

*The council identified several of ways in which this could be achieved. The implementation of a number of energy saving initiatives included, energy saving lighting, cavity wall insulation and AMR's, which have allowed the council to measure its energy consumption.*

#### **Current status**

*The Council implemented a number of energy saving initiatives at various sites across the borough. Electricity AMRs were installed in ten sites, including the council's Guildhall and Kidsgrove Town Hall. The addition of gas AMRs at further sites meant energy consumption could be comprehensively monitored. Readings ranging from half hourly to annually can now be collated, meaning the council are able to identify energy peaks and unusual usage, therefore eliminating waste and unnecessary usage.*

*Cavity wall insulation and double glazing was implemented at six sites in total and low energy lighting was installed at the Borough museum. Passive infra red (PIR) sensors and lighting controls were fitted at various sites, with the intention of developing this at other sites throughout the Borough. Other initiatives included fitting efficient water heaters.*

*As a result of the strategy, impressive results are already being seen.*

- *Electricity consumption during 2012/13 was reduced by 31%*
- *Installing PIR sensors and energy efficient water heaters has resulted in one car park seeing a saving of £4,000 in the last year alone*
- *Installation of cavity wall insulation at one building has seen electricity consumption reduced by 23% when compared to the previous year*

#### **Lessons learnt**

- *The importance of a clear understanding of current costs and the effects of energy saving projects*
- *Comprehensive data collection is vital, to ensure the right decisions can be made with regard to energy initiatives and to continually improve on performance*
- *The importance of collaborative working across all council buildings to maintain improvements in energy usage*

## **CASE STUDY**

### **NORTH WARWICKSHIRE BOROUGH COUNCIL – IMPLEMENTATION OF SERVER VIRTUALISATION**



North Warwickshire  
Borough Council

#### **Background**

*IEWM initially funded an 'Energy and Water Efficiency Audit' which identified some quick wins to reduce energy costs associated with more appropriate energy contracts and tariffs. The audit also made suggestions around cooling in the server room, installing LED lighting and server virtualisation.*

*The Council originally put in a bid to IEWM for the funding to replace the server room cooling system as the audit has suggested this project gave the best return on carbon reduction. However, changes to timescales and a realisation that some of the issues could not be solved with the current ICT infrastructure led to a revised bid for funding to contribute to a server virtualisation project. Server virtualisation is the partitioning of a physical server into smaller virtual servers to help maximize server resources. This allows each virtual server to run its own operating system and each server can also be independently rebooted of one another. Server virtualisation also reduces costs because less hardware is required.*

#### **Current status**

*The Council went out to tender for a server virtualisation solution and new network infrastructure using a Government Procurement Service framework agreement. The solution was implemented in about six months as there were critical dates that could not be missed or slipped. The Council have already decommissioned a number of old servers and this process will continue. Reductions in energy use are being seen but the true scale of reduced energy use will start emerging from June 2014 when all the work is complete and old systems are fully decommissioned.*

*The Council is reducing the size of the server room by more than 50%. The old server is being replaced with a lower cost, smaller, more energy efficient and resilient solution. By reducing the size of the server room space has been created on the ground floor of the Council House allowing partners to work alongside the Council Customer Contact Staff.*

*The supplier who implemented the virtualised infrastructure estimated that once fully implemented the Council will be saving in the region of 200,000 kwh per annum which equates to savings in the region of £20,000 per annum.*

#### **Lessons learnt**

- *The Council have had a fairly unique opportunity to make major changes and consider how to rebuild infrastructure so that it provides a cost effective and energy efficient solution for the foreseeable future.*
- *A key lesson has been the need to be flexible and responsive to emerging priorities and to change project plans as things develop.*

*IEWM demonstrated a real understanding of the need to be flexible and that as timescales and priorities changed the Council needed to be able to respond appropriately and give support to business needs.*

## 5.4 Local energy production

CHP can offer a cost effective way of providing heat and power which is less environmentally harmful than conventional methods. CHP produces usable heat and electricity in one single, highly efficient process. This contrasts with conventional ways of generating electricity where vast amounts of heat are wasted. The overall efficiency of CHP plants can be in excess of 80% at the point of use. In comparison, a UK combined cycle gas turbine plant (CCGT) can range in efficiency between 49% and 52% with coal-fired plants having an efficiency of just 38%.

CHP plants provide local heat, electricity and sometimes cooling to various users. Because the energy is produced locally, CHP avoids efficiency losses incurred through transmission and distribution of electricity through the National Grid and local distribution networks.

A district heating scheme comprises a network of insulated pipes to deliver heat (as hot water or steam) from the point of generation to an end user.

Heat networks can be supplied with heat from a diverse range of energy sources including:

- power stations
- energy from waste (EfW) plants
- industrial processes
- biomass and biogas fuelled boilers and CHP units
- gas-fired CHP units
- fuel cells
- heat pumps
- geothermal sources
- electric boilers and even solar thermal arrays

The ability to integrate diverse energy sources means customers are not dependent upon a single source of supply. This helps guarantee reliability, continuity of service and can introduce an element of competition into the supply chain.

District heating networks can currently extend up to around 30 km from the generating plant and distribution networks can be hundreds of kilometres long. This is sufficient to carry heat across cities, smaller communities and industrial areas. The distance a network can reach is also easily extended by simply adding more providers of heat, or 'heat sources', along the way.

Networks also have the ability to balance the supply and generation of heat, across location and over time. Over the course of the day, heat demand shifts between residential consumers to commercial, industrial and public buildings and back again. A heat network can match and manage these flows, whilst maximising the utilisation of the plant providing the heat. Demand can also be managed across seasons, with networks supporting the operation of distributed absorption cooling plants in the summer providing cooling on a significant scale.

IEWM recognise that considerable carbon and cost savings can be achieved as a result of providing energy via CHP and district heating. In 2010 IEWM funded a study<sup>2</sup> into the feasibility of CHP and district heating across the seven Metropolitan Councils in the West Midlands. Led by Birmingham City Council, the results highlighted that the business case was viable in most Councils.

There were practical barriers to a single collaborative procurement; consequently each Council pursued their own solution. Coventry City Council has installed a network connected to their Energy From Waste (EfW) plant and others such as Wolverhampton and Solihull are still in discussions as to the way forward. This highlights the difficulties in delivering major capital infrastructure projects of this nature but those who have demonstrated a clear business case and have political commitment can make it happen. Birmingham City Council has led the way in developing CHP district heating infrastructure. The first Broad Street Scheme has been running efficiently across the city centre since 2007. This provides hot water for heating and electricity and cold water for air conditioning to many of Birmingham's most prominent buildings including:

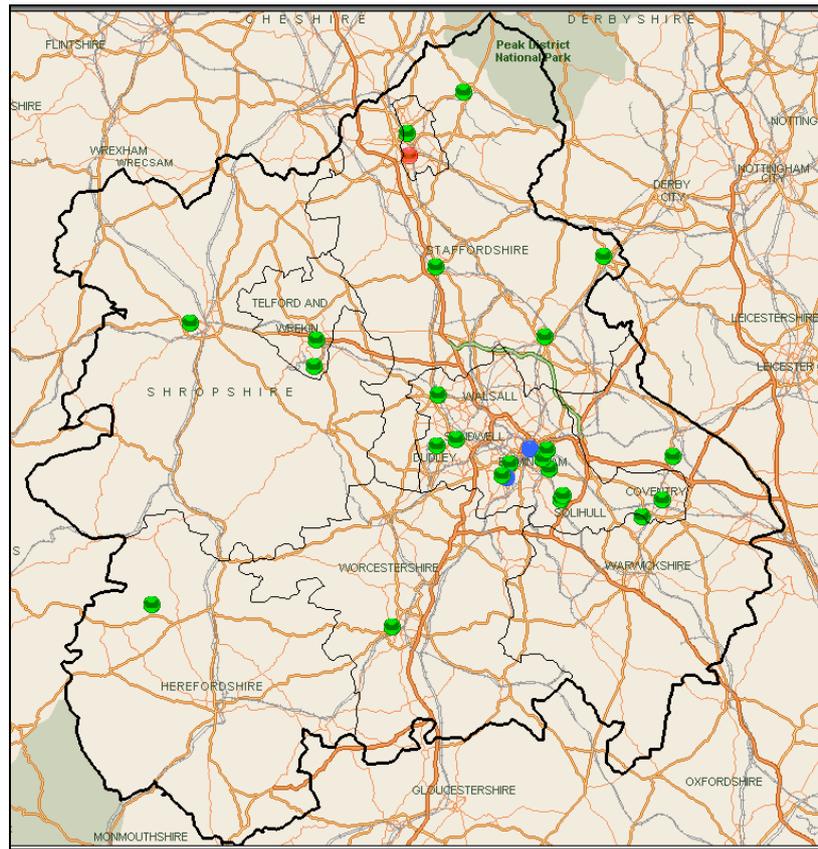
- The International Conference Centre
- The National Indoor Arena
- The Town Hall
- The Council House
- Hyatt Regency Hotel
- The Repertory Theatre
- Paradise Forum leisure and retail centre
- Cambridge and Crescent high rise tower blocks
- New Birmingham Library

SWM have consulted with local authorities within the West Midlands to establish the type of support that would benefit them the most. As a result we have produced an up to date map and list of CHP and district heating schemes within the region, including contact details and technical details. This resource will allow organisations that are developing projects to identify others that have already implemented projects, to connect with them and share experiences.

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<sup>2</sup> More details are available at: <http://www.westmidlandsiep.gov.uk/index.php?page=773>

**Figure 2: Map of CHP and district heating schemes in the West Midlands**



We have also developed a practical guide to ‘Implementation Steps to large Scale District Heating’<sup>3</sup> that will allow organisations to identify practical steps to delivering district heating schemes, learning from the excellent projects that have already been implemented by Birmingham, Coventry, Leicester and Nottingham city councils.

<sup>3</sup> <http://www.sustainabilitywestmidlands.org.uk/wp-content/uploads/P202-2c-Final-District-Heating-Guide.pdf>

## 6. Working together

By working together and sharing experiences we believe that energy efficiency and carbon reduction can be more easily achieved by local authorities. As a way of helping local authorities share good practice SWM have used a proportion of the funding from IEWM to support the West Midlands Energy Managers Network. The network is intended to provide a forum for sharing of good practice, of lessons learnt and relevant information. Members of the network are largely from the public sector and include local authorities, universities, hospitals and the police. The network is chaired by a representative from Worcestershire County Council.

The most effective way of sharing good practice is through free site visits which are held every four months and allow network members to go and see energy efficient technology in situ. In the last six months the network has visited Rugby Borough Council to see the LED lighting installed at their town hall and city centre car park, and Worcestershire County Council to see their new biomass boiler and server room 'eco-cooling' facility.

As well as organising the visits for the network, SWM maintain a webpage with current information related to energy management and members of the network receive regular updates via a newsletter.

## **CASE STUDY**

### **WORCESTERSHIRE COUNTY COUNCIL – WORKING WITH OTHERS AND SHARING GOOD PRACTICE**



#### **Background**

*Worcestershire County Council are extremely proactive when it comes to sustainability with dedicated teams focusing on carbon reduction, energy management and sustainability. As well as the good work carried out in house the Council are also dedicated to sharing good practice with other public sector organisations by providing chair people for the West Midlands Energy Managers Network and Sustainable Development Officers Network.*

#### **Current status**

*SWM coordinate the Energy Managers Network which is chaired by the Energy Manager at Worcestershire County Council. The Sustainable Development Officers Network is chaired by Worcestershire's Sustainability Manager.*

*The main function of the Energy Managers Network is to provide profile, drive, leadership and support to improve energy management and maximise efficiency savings mostly within the public sector. The Sustainable Development Officers Network aims to help local authorities in the West Midlands to achieve cost reductions, cost prevention and creation of green private and third sector jobs through the transition to a low carbon economy. Both networks share good practice between members through workshops and site visits as well as e-newsletters. Worcestershire County Council have hosted a visit of the Energy Managers Network where members had the chance to see the council's new biomass boiler and eco-cooling plants in operation. The Energy Managers Network have previously visited Rugby Borough Council to see the LED lighting installed at the town hall and part funded by IEWM.*

*By understanding the technicalities, practical aspects and cost benefits of installing energy efficient technologies through real life examples, other councils are more likely to consider these technologies as solutions for their own local authorities.*

*SWM believe that it is important to have local authorities chairing these networks to ensure that the issues covered at meetings are of interest to other local authorities attending, and that any issues raised will be effectively dealt with. The local authority chairs also have the best knowledge of other good practice case studies and appropriate speakers for meetings and workshops. SWM work with the network chairs to define annual work programmes at the start of each financial year.*

#### **Lessons learnt**

- *Networks are an effective means of sharing good practice with like-minded organisations with minimal associated resources and costs*
- *Having a local authority chair allows good practice networks to best represent the needs of their members*
- *Coordination of the network should be carried out by an independent organisation so that the demands on local authorities are not too onerous*

## 7. Summary

This report highlights a number of areas in which authorities in the West Midlands have successfully taken on the challenge of reducing energy use and working more sustainably in this very difficult economic climate.

The experience of the projects featured in this report shows that significant cost and carbon savings were achieved in many cases from fairly small levels of investment. This offers a real opportunity for many more authorities as budgets continue to tighten.

It is hoped that the experience and lessons learned will enable other authorities to make similar, if not greater savings and reduced carbon emissions. Finally, transparency is key if together we are to protect, even enhance public services, and the authorities mentioned in this report have been open about the lessons learnt, while documenting the successes. We wish to thank those officers and members for their considerable help in producing this report.

## 8. More information

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