

Warwickshire County Council

Building Energy Consumption Review

April 2012 to March 2013

Report prepared by Resources Group: Physical Assets / Construction Services / Energy Team

<http://www.warwickshire.gov.uk/energyperformance>

<http://www.warwickshire.gov.uk/energyandwater>

Version History

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January 2014	1	Basis of report prepared and sent out for consultation.	Dr Jacky Lawrence, Energy Manager Bradley Gallagher, Energy Data Analyst
February 2014	2	Request to develop case studies, change content around and include explanation of terms used.	Craig Roberts, Construction Services Manager
June 2014	3	Additional information included in report and contents re-ordered.	Dr Jacky Lawrence
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This publication reports on energy consumption for buildings in the Warwickshire County Council (WCC) property portfolio (for property specific details - see Appendix). The data was gathered for reporting on the Carbon Reduction Commitment Energy Efficiency Scheme (CRC-EES) and forms part of the required evidence pack. Similar reports for 2010/11 and 2011/12 can be found on the internet on the WCC Energy Performance web page <http://www.warwickshire.gov.uk/energyperformance> or from the following links.

2010/11 Building Energy Consumption Review
<http://apps.warwickshire.gov.uk/api/documents/WCCC-599-14>

2011/12 Building Energy Consumption Review
<http://apps.warwickshire.gov.uk/api/documents/WCCC-599-15>

These documents contain further information about energy management at WCC.



Summary

This report gives information about energy consumption (electricity and gas) at WCC properties for the financial year 2012/13 and compares it to data from 2011/12 and 2010/11.

The 12/13 energy data was collected for reporting on the Carbon Reduction Commitment Energy Efficiency Scheme (CRC) and forms part of the required CRC Evidence Pack.

2013 is the third year WCC has undertaken CRC reporting. With electronic invoice data, annual supplier statements, direct meter readings and voluntary automatic meter reading (AMR) installed the data continues to improve. Even so, the data quality and accuracy can still be improved upon year on year. Common potential sources of data inaccuracy include:

- Meter read errors or meter faults.
- Paying invoices based on estimated readings.
- Uncorrected billing errors.
- Submitting customer reads in the wrong unit of measure (e.g. confusing m³ with kWh).

The data in this report provides a basis for further more detailed investigations wherever it provokes questions. Both higher than average and lower than average energy consumption need to be investigated to find out:

- Why this is the case?
- To better understand energy consumption and cost in WCC properties.
- To gather more accurate data where necessary.
- To learn from best practice in order to know what to do to reduce costs where things can be improved, and
- To develop Warwickshire specific benchmarks and targets.

Section 1: Monitoring and Targeting

Avoidable, but perhaps not obvious, energy consumption happens all the time. Without adequate consumption data and subsequent analysis of that data it is possible that opportunities to save energy and money will be missed.

The purpose of monitoring and targeting (M&T) at WCC is:

- to understand and effectively manage energy consumption across the whole property portfolio,
- identify factors which impact on that energy consumption,
- help identify waste and overspend,
- compare peak demand with Authorised Supply Capacity (ASC),
- review the energy performance of buildings,
- produce Display Energy Certificates (DECs) & bespoke energy reports,
- provide feedback for staff awareness and
- enable the setting of appropriate (practical and achievable) targets.

Systemslink

WCC uses a SystemsLink Energy Manager database to manage utility consumption data across the entire property stock. Consumption data from suppliers, smart meters, data loggers and direct meter readings can be stored for all utility meters at all sites along with site details, floor areas, pupil numbers (where relevant), account and meter details and monthly Degree-day information.

Systemslink drives the read-only Energy Module on AtlasWeb, which is available to all WCC building managers and WES schools through a secure system (user name and password required) on the intranet. SystemsLink can be used to create various graphs and reports such as:

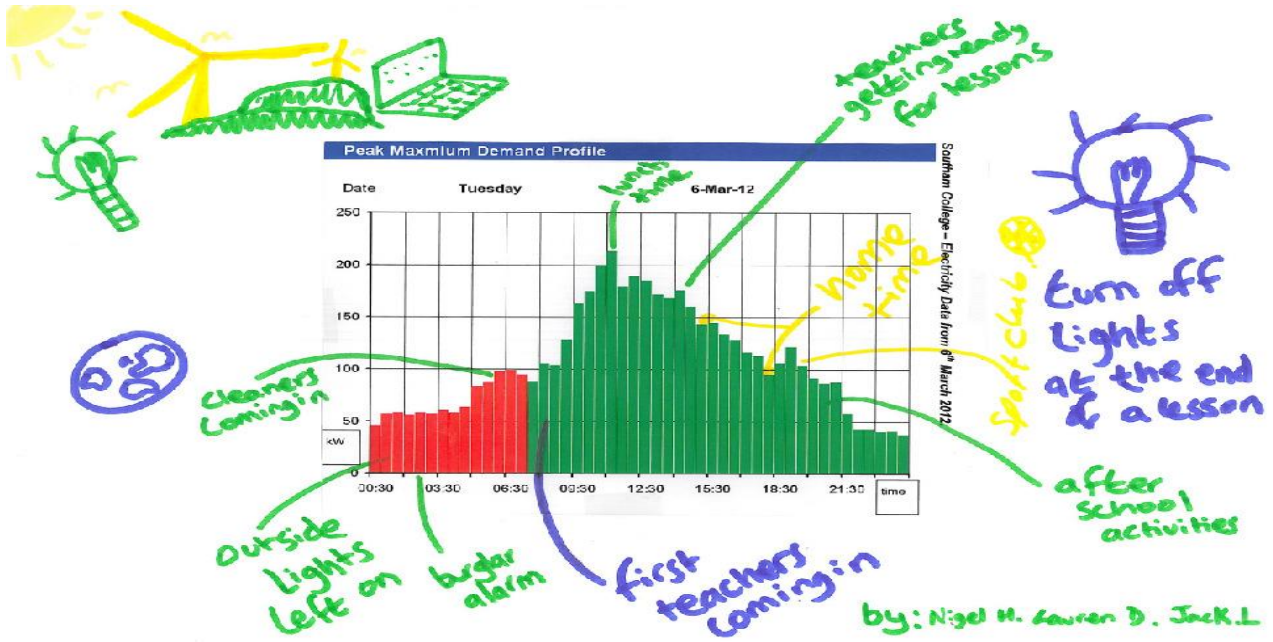
- Year on year comparisons of consumption, costs or carbon dioxide (CO₂) figures,
- Regression analysis¹, CUSUM²,
- Half-hourly data on a week by week or month by month basis
- Further information on the AtlasWeb SystemsLink Energy Module can be found on the internet at this link:

<http://www.warwickshire.gov.uk/wp-content/uploads/2011/12/AtlasWeb-Energy-Flyer-draft-2-5.pdf>

¹ Regression analysis is a statistical tool for the investigation of relationships between variables. A regression analysis shows how well two variables correlate with one another, but correlation doesn't always imply causation. The statistical significance of the relationship needs to be assessed to give a degree of confidence. How well the line of best fit correlates with the data points is measured by the R² value (R squared). This number is between 0 and 1 and tells you how much of the variation in the dependent variable is explained by the independent variable. The value of one is a perfect fit.

² CUSUM is short for cumulative sum of difference. It is a techniques used to detect a persistent departure from an expected bench-mark (from the line of best fit obtained from regression analysis). The difference between the actual and benchmark value is calculated and cumulatively summed up (thus CUSUM). CUSUM can be plotted against time on a new graph. A horizontal line indicates no savings. A downward slope indicates savings. An upward slope indicates more energy is being consumed than expected. A variation in the slope indicates where a change occurs in the efficiency of energy consumption.

SystemsLink Half-Hourly Data Lesson Plan



Systemslink reports can be used as an educational tool. An AMR (Smart Meter Half-Hourly Data) lesson plan can be accessed via the internet at this link:

<http://www.sustainabilitywestmidlands.org.uk/wp-content/uploads/genericSchoolAMRlessonplan.pdf>

Section 2: Total Energy Consumption Reported for the Carbon Reduction Commitment (CRC) 2013

The CRC Energy Efficiency Scheme (CRC) is a mandatory UK-wide scheme that was brought into law via the CRC Energy Efficiency Scheme Order 2010 (SI 2010/768) (the “CRC Order”). The CRC was brought in with the aim of improving energy efficiency, reducing energy bills and cutting carbon emissions. WCC submitted its third annual report by the deadline of July 31st 2013.

Electricity MPANs Explained

Each meter point has a unique number, known as an MPAN (Meter Point Administration Number). ECOES (Electricity Central Online Enquiry Service) is a national database that holds the MPAN numbers for all properties.

Meter time switch code			
	Profile Type	Line loss factor	
S	00	111	222
	11	1234 5678	345
Unique identifier			
District Network Operator ID		Check digit	

The core MPAN (bottom line) is 13 digits long and remains constant for the lifetime of the meter.

The first two digits on the bottom row are the District Network Operator’s (DNO) ID. A DNO effectively distributes electricity from the National Grid to the customer. 11 and 14 are for the Midlands where the DNO is Western Power Distribution. A supplier buys the electricity from the distributor.

Profile Types

The first two digits of the top line of the MPAN is the profile type and ranges from 00 to 08 broadly depending on whether the meter is Half-Hourly (HH) or Non-Half-Hourly (NHH). This is a reference to the available capacity of the electricity supply in kVA³ or the amount of electricity required to power a building. A 00 profile type means that in a particular half-hour period it can use 100 kVA or more. The supply must consume more than 100 kVA for at least half-hour in at least three quarters of a year. If the supply consecutively draws this much energy, the installation of a Half-Hourly meter is mandatory. Domestic supplies are either 01 or 02 profile types.

- 00 - Half-hourly supply (import and export)
- 01 - Domestic, Single rate unrestricted
- 02 - Domestic, Day / Night split, Economy 7.
- 03 – Non-domestic / commercial, Single rate, unrestricted

³ kW = kVA * power factor. The power factor (pf) is a number between +1 and -1. If the pf = 1 the load is purely resistive and flows from the source to the load. It does not include any capacitors or inductors that can store electricity momentarily and return it to the source. If the pf = -1 all the power is flowing from the load to the source. kVA (voltage multiplied by current) is called the apparent power – the total amount of power that is circulating back and forth between the source and the load.

- 04 – Non-domestic, Day / Night split, Economy 7
- 05 – Non-domestic with Maximum Demand (MD) recording capability with a Load Factor (LF) ⁴ less than or equal to 20%
- 06 – Non- domestic, with MD recording capability with a LF less than or equal to 30% and greater than 20%
- 07 - Non- domestic, with MD recording capability with a LF less than or equal to 40% and greater than 30%
- 08 - Non- domestic, with MD recording capability with a LF greater than 40%

CRC Simplification

Previously, electricity and gas consumption data was reported as either core or residual supplies⁵. The Department of Energy and Climate Change (DECC) published the Government's response on simplifying the CRC Energy Efficiency Scheme in December 2012.

Changes came into force immediately for the remainder of Phase 1 so WCC reported in 2013 according to the new rules. Only two fuels remained in the scheme (electricity and gas used for heating purposes) down from 29. The 90% rule, which required that carbon emissions from supplies were identified as either core or residual in a footprint report, was removed, meaning 100% of emissions from relevant electricity and gas supplies must now be reported. The Performance League Table was abolished. Gas meters consuming 73,200 kWh or less were excluded. Electricity meters with profile classes 01 and 02 were excluded.

Previously an electricity supply was a core supply when supplied via a meter profile of 05, 06, 07, 08 or 00. Electricity supplied through 03 and 04 meters were residual supplies and could be excluded from the CRC report if an organisation still reported within the 90% rule.

For Phase 2 of the CRC, qualification criteria will be restricted to only electricity supplied through the settled half-hourly market; state funded schools are to be withdrawn from the CRC and all street lighting will be brought into the scope.

WCC will not consume enough qualifying electricity (6,000 MWh) through the settled half-hourly market to be a participant in Phase 2. However, WCC intends to continue to produce an Annual Building Energy Consumption Review on the same lines as the ones produced for the CRC Evidence Pack. Changes to the legislation may bring other meters into the qualification criteria, so it is possible that WCC will be a participant in Phase 3.

⁴ Load Factor = is defined as the average load divided by the peak load in a specified time period.

⁵ Core = all half-hourly meters, meter profile classes 5-8, daily-read gas meters, hourly gas meters, non-daily metered gas > 73,200 kWh/annum. Residual = all the non-core supplies. Non-core supplies had to be included to reach a minimum of 90% of total consumption.

WCC's CRC Data 2012 / 13

Electricity consumption data was collated for **412** properties with a gross internal floor area of **842,899 m²**. **Gas** consumption data was collated for **307** properties with a gross internal floor area of **794,049 m²**. Weather correction is not allowed to be applied to the gas used for space heating. 76% of reported emissions were from educational properties (32,710 tonnes CO₂), 24% were from corporate properties (10,323 tonnes CO₂).

For a gas or electricity bill to be treated as accurate at least two meter readings for at least a six-month period are required during any compliance year. Where there are gaps in actual data a valid CRC estimation method must be used. Where there is greater than 6 months of the year where no actual data is available, 10% uplift in the amount of emissions is added on automatically to the total emissions.

CRC 12/13	Actual Supply (kWh)	Estimated Supply (kWh)	Total (kWh)	Emissions (t CO ₂)
Electricity	32,074,834	10,100,499	42,175,333	23,362
Gas	105,155,411	1,725,113	106,880,545	19,668
Total Emissions				43,030

Table 1 Electricity and gas consumption plus CO₂ emissions from electricity and gas (for properties) according to the CRC Annual Report 2013

Item	Year	No. of Properties	Gross internal floor area (m ²)	Total emissions reported (tonnes CO ₂)
Core and residual electricity	2010/11	420	827,632	35,479
Core and residual gas	2010/11	351	779,648	20,063
Total	2010/11		1,607,280	55,541
Core and residual electricity	2011/12	378	763,179	22,159
Core and residual gas	2011/12	289	716,196	15,819
Total	2011/12		1,479,975	37,978
Electricity	2012/13	412	842,899	23,362
Gas	2012/13	307	794,049	19,668
Total	2012/13		1,636,948	43,030

Table 2 Summary of emissions according to all WCC's CRC Annual Reports

CRC 2012	Actual Supply (kWh)	Estimated Supply (kWh)	2012 Calculated emissions (tonnes of CO ₂)
Core Electricity	28,532,141	1,534,244	16,348
Residual Electricity	3,801,725	6,310,117	5,811
		Total Electricity	22,159
Core Gas	74,690,417	10,428,730	15,819
Residual Gas	0	0	0
		Total Gas	15,819
		Total Electricity + Gas	37,978

Table 3 Annual emissions from WCC's consumption of electricity and gas (for properties) according to the CRC Annual Report 2012

CRC 2011	Actual Supply (kWh)	Estimated Supply (kWh)	2011 Calculated emissions (tonnes of CO ₂)
Core Electricity	52,284,103	2,502,423	29,774
Residual Electricity	3,525,921	6,383,678	5,705
		Total Electricity	35,479
Core Gas	92,472,472	15,280,736	20,063
Residual Gas	0	0	0
		Total Gas	20,063
		Total Electricity + Gas	55,541

Table 4 Annual emission from WCC's consumption of electricity and gas (for properties + street lighting) according to the CRC Annual Report 2011

CRC Emission Factors

EMISSION FACTORS	Emission Factor
Electricity (note estimated supply has a 10% uplift)	0.541 kg/CO ₂
Gas	0.1836 kg/CO ₂

Table 5 CRC emission factors

CRC Reporting Metric

The 12/13 reported annual emissions were 43,030 tonnes CO₂, WCC's gross revenue expenditure for 12/13 was £748,700,000. The CRC metric is tonnes of carbon dioxide per million pounds of gross revenue expenditure [factors impacting on energy consumption on the next page].

Rolling average CO ₂ emissions per £1million gross revenue expenditure	2010/11	2011/12	2012/13
	63.01	44.96	= 43,030 / 748.7 = 57.47

Table 6 Emissions per £million gross revenue expenditure

Factors Impacting on Energy Consumption in WCC Properties

Various factors can impact on the amount of energy consumed in the building.

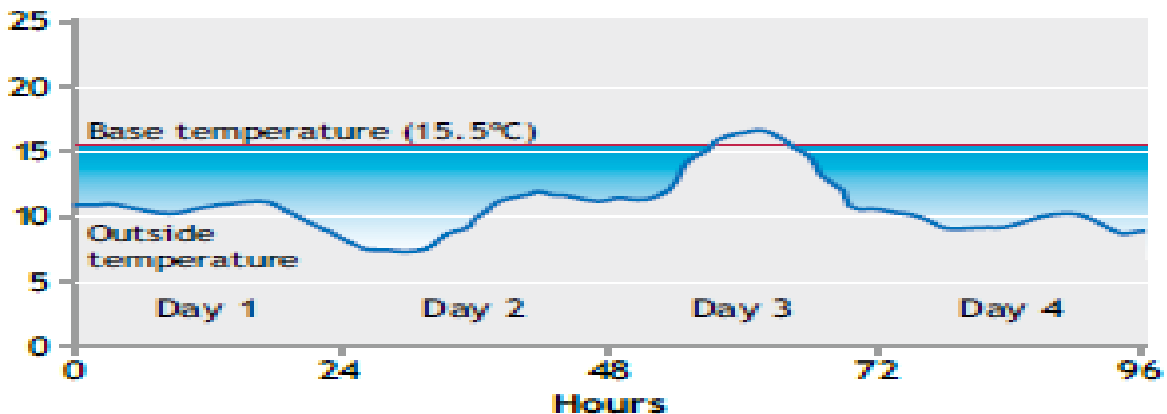
Degree Days

Degree Days⁶ are a reflection of the demand for energy needed to heat a building. It is a measure of outside air temperature and depends on the severity and duration of cold weather. The colder the weather, the more heating is needed, the larger the degree-day value for that month in that location.

The base temperature used to calculate degree days in the UK is 15.5°C, because at this temperature most UK buildings do not need supplementary heating (18.5°C for hospitals).

The figure below, from the Carbon Trust, shows the summation over time of the difference between the 15.5 °C base temperature and the outside temperature over four days. The blue shaded area is the total degree-day value for the four days. The summation for each calendar month is published as historical data for 18 different regions in the UK.

Figure 1 The shaded area is the degree-day value for the period



When the outside temperature rises above the base temperature, degree days are taken as zero.

Midland data is imported into WCC's SystemsLink Energy Management Database. They can be used with consumption data to help identify best and worst performing sites and helps target energy waste and anomalies such as system faults in order to save money and raise awareness.

⁶ <http://www.carbontrust.com/media/137002/ctg075-degree-days-for-energy-management.pdf>

Degree Day Calculations⁷

Degree Days is a measure of the difference between the baseline and the actual outdoor temperature multiplied by the number of days. For example - the temperature measured hourly records a temperature of:

7.5 °C for 48 hours (2 days) the degree days total would be: $(15.5\text{ °C} - 7.5\text{ °C}) \times 2 = 16$

Degree Day Data for CRC Reporting

The table below shows that 12/13 was the coldest year for CRC reporting to date. This means that more energy would have had to be consumed for heating properties.

FACTOR	2010/11 (CRC Qualification year)	2011/12 (CRC year 1)	2012/13 (CRC year 2)
Degree days heating*	2,497	2,031	2,640

Table 7 Degree Days in each CRC reporting year

Degree Days in each CRC Reporting Year

Property Rationalisation Programme

WCC are rationalising their property portfolio to help in meeting the council's savings targets – with the primary objective to generate a £4.4m saving by March 2015. The programme is making sure WCC have the right properties in the right place, providing a modern and flexible working environment.

Building User Behaviour

Although many people state they are concerned about the environment, this does not always translate into taking practical steps to reduce energy consumption (and therefore emissions) either at home or at work.

There are many cost effective energy efficiency technologies available they may not yet have been invested in for a variety of reasons including financial.

The Behavioural Insights Team at DECC⁸ reported on what action government departments (covering 300,000 civil servants in 3,000 buildings) would take to reduce their carbon emissions by 10% between 14th May 2010 and 13th May 2011 and 25% by 2015 through:

- Eliminating unnecessary or redundant external and internal lighting.
- Changing defaults for lighting, heating and cooling during optimal core hours.
- Aligning operating temperatures with best practice for the public sector, so that buildings are never heated above 19°C or cooled below 24°C.

⁷ <http://www.degree-days-for-free.co.uk/pdf/TM41.pdf> CIBSE

⁸ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/60536/behaviour-change-and-energy-use.pdf

- Ensuring that buildings are shut down effectively during quiet periods such as between Christmas Day and the New Year bank holiday.
- Publishing monthly performance league tables showing progress towards the target.
- Having the energy targets on the agenda for meetings between Cabinet and Permanent Secretaries.
- Installing real time energy displays in 19 Whitehall HQ buildings.
- A competition to see which HQ building could save the most energy relative to the previous month and releasing details of how the winning department achieved their savings to reinforce this behaviour as a social norm.

A Performance League Table is in the process of being developed for WCC centralised properties. The database will be used to produce quarterly and annual reports on energy consumption per unit of floor area (kWh/m²). This will allow the Facilities Service Support Managers to work with building users to drive down consumption where possible through behaviour change and improve efficiency. The annual league table based on the CRC data is in the Appendix.

CRC Electricity Overview (All Properties)

Electricity Consumption per Unit of Floor Area (kWh/m²)

Electricity kWh / m ²	2010/11	2011/12	2012/13
Most frequently occurring electricity consumption range	30 kWh/m ² – 60 kWh/m ²	25 kWh/m ² – 55 kWh/m ²	35 kWh/m ² – 55 kWh/m ²
Electricity consumption per square metre of floor area range	3 kWh/m ² – 1,276 kWh/m ²	0.72 kWh/m ² – 352 kWh/m ²	1 kWh/m ² – 662 kWh/m ²

Table 8 2010/11/12/13 kWh/m²

Electricity Cost per Unit of Floor Area (£/m²)

Electricity £ / m ²	2010/11	2011/12	2012/13
Most frequently occurring electricity cost range	£2/m ² – £5/m ²	£2.50/m ² - £5.50/m ²	£3.25/m ² – £5.23/m ²
Electricity cost per square metre of floor area range	£1/m ² – £104/m ²	£0.55/m ² - £31.71/m ²	£0.10/m ² - £62.89/m ²

Table 9 2011/12/13 £/m²

Electricity Consumption per Pupil (kWh/Pupil)

Electricity kWh / pupil	2010/11	2011/12	2012/13
Most frequently occurring electricity consumption per pupil range	No data available	200 kWh/pupil - 400 kWh/pupil	250 kWh/pupil – 450 kWh/pupil
Electricity consumption per pupil range	No data available	22 kWh/pupil - 2,592 kWh/pupil	111 kWh/pupil – 943 kWh/pupil

Table 10 2011/12/13 kWh/pupil

Electricity Cost per Pupil (£/Pupil)

Electricity £ / pupil	2010/11	2011/12	2012/13
Most frequently occurring electricity cost per pupil range	No data available	£20/pupil – £40/pupil	£23.75/pupil - £42.75/pupil
Electricity cost per pupil range	No data available	£1.96/pupil - £233.25/pupil	£10.55/pupil - £89.59/pupil

Table 11 2011/12/13 £/pupil

CRC Gas Overview

Gas Consumption per Unit of Floor Area (kWh/m²)

Gas kWh / m ²	2010/11	2011/12	2012/13
Most frequently occurring gas consumption range	110 kWh/m ² – 160 kWh/m ²	75 kWh/m ² – 125 kWh/m ²	88 kWh/m ² – 169 kWh/m ²
Gas consumption per square metre of floor area range	9 kWh/m ² – 3,831 kWh/m ²	6.28 kWh/m ² - 2,522 kWh/m ²	42 kWh/m ² – 621 kWh/m ²

Table 12 2010/11/12 kWh/m²

Gas Cost per Unit of Floor Area (£/m²)

Gas £ / m ²	2010/11	2011/12	2012/13
Most frequently occurring gas cost range	£2/m ² – £5/m ²	£2/m ² – £4/m ²	£2.87/m ² - £5.51/m ²
Gas cost per square metre of floor area range	£1/m ² – £106/m ²	£0.18/m ² - £70.61/m ²	£1.37/m ² - £20.18/m ²

Table 13 2010/11/12/13 £/m²

Gas Consumption per Pupil (kWh/Pupil)

Gas kWh / pupil	2010/11	2011/12	2012/13
Most frequently occurring gas consumption per pupil range	No data available	500 kWh/pupil – 900 kWh/pupil (primary's only) 700 kWh/pupil – 950 kWh/pupil (secondary's only)	500 kWh/pupil – 1250 kWh/pupil
Gas consumption per pupil range	No data available	107 kWh/pupil- 6,842 kWh/pupil	333 kWh/pupil- 3196 kWh/pupil

Table 14 2010/11/12/13 kWh/pupil

Gas Cost per Pupil (£/Pupil)

Gas £ / pupil	2010/11	2011/12	2012/13
Most frequently occurring gas cost per pupil range	No data available	£15/pupil - £25/pupil	£16.30/pupil - £40.63/pupil
Gas cost per pupil range	No data available	£1.33/pupil - £1,499/pupil	£10.82/pupil - £103.87/pupil

Table 15 2010/11/12 £/pupil

Year on Year Changes (Properties only)

The first year that Annual Supplier Statements were available for reporting on the CRC was 2010/11. Data before that was based on consumption data contained in the SystemsLink database and cost per unit assumptions with financial data from the ledger.

Reasons for the Wide Range of Values and Year on Year Changes in Energy Consumption and Cost

Values

The wide range of values is due to a number of reasons such as:

- There could be a high number of under-estimates or over-estimates accepted on which invoices were paid rather than being based on customer reads where an actual read was not taken.
- The property may have been vacated during the year resulting in low consumption.
- The meter reported on may supply more properties than where the address is – such as Shire Hall meter also covers Barrack Street.
- The data sets that have been made available to us may be incomplete.
- There may have been a change of supplier during the year.
- There may be billing issues such as corrections, overcharges and refunds.
- Meters may have been read incorrectly, or reported in the wrong units – e.g. confusing the gas units kWh with m³.
- WCC are only responsible for reporting energy consumption in communal areas of business centres, not units used by private businesses.
- Pupil numbers should be treated with caution as they change regularly. Some of the pupil numbers we have may not be up to date.
- Buildings used for the same purpose vary in age and construction type.
- Buildings used for the same purpose may be open plan or cellular.
- Building user behaviour varies considerably from highly motivated to be energy efficient to very wasteful depending on the social norms within the building and leadership from above.
- Hours of use for buildings used for the same purpose may vary widely. Some may be open at weekends and holiday periods.
- Some buildings used for the same purpose may be fully air conditioned; others may only have natural ventilation, others as combination.
- A small number of schools have swimming pools and hydrotherapy pools.
- Some buildings in the south of the county where there is no gas network may have only electric heating or oil heating or a combination of oil and electricity. Etc.

Yearly comparisons

Changes in 12/13 compared to 2011/12 are due to a number of reasons.

The 43,030 tonnes CO₂ (schools and corporate properties) for 12/13 is:

- A 13.3% increase on the 37,978 tonnes CO₂ reported in July 2012;
- 3.8% higher than for properties only in July 2011.

Year	Total tonnes CO ₂	Total cost of Allowances	Change in carbon dioxide emissions on previous year	Change in carbon dioxide emissions on 2010/11
08/09	45,467			
09/10	47,600		4.7%	
10/11	41,472		-12.9%	
11/12	37,978	£455,736	-8.4%	-8.4%
12/13	43,033	£516,396	13.3%	3.8%

Table 16 All CRC CO₂ emissions 2008 -13

Schools carbon dioxide emissions in the 12/13 report:

- Rose by 7.2% on the 11/12 report and
- Dropped by 1.5% on the 10/11 emissions.

Year	Schools CO ₂	% of total emissions	Cost of Allowances	Change in carbon dioxide emissions on previous year	Change in carbon dioxide emissions on base year 2010/11
10/11	33,200	80%			
11/12	30,521	80%	£366,252	-8.1%	-8.1%
12/13	32,710	76%	£392,520	7.2%	-1.5%

Table 17 Schools CO₂ emissions 2010 - 13

Corporate properties carbon dioxide emissions in the 12/13 report:

- Rose by 38.4% on the 11/12 report and
- Rose by 24.8% on the 10/11 emissions.

Year	Corporate CO ₂	% of total emissions	Cost of Allowances	Change in carbon dioxide emissions on previous year	Change in carbon dioxide emissions on 2010/11
10/11	8,272	20%	£99,258	-58.8%	
11/12	7,457	20%	£89,484	-9.8%	-9.8%
12/13	10,323	24%	£123,876	38.4%	24.8%

Table 18 Cost of allowances

- In 10/11 and 11/12 WCC was able to report on a total of only 93% of its total carbon dioxide emissions from electricity, gas and heating oil consumption. WCC could exclude some residual carbon dioxide emissions.
- The properties that were excluded (in the 7% of emissions classed as residual and not reported) were all the properties on the sensitive property list (to make future

years more comparable as properties were disposed of), schools about to become academies (as they won't be part of WCC in future) and all the ones with oil fired heating (due to difficulties in obtaining robust and accurate consumption data).

- In 12/13 the CRC rules changed and WCC had to report on 100% of its total carbon dioxide emissions, but from only electricity and gas consumption rather than all fuels. This resulted in having to report on electricity and gas consumption for an extra 8% of property by floor area, an extra 38 corporate properties and 7 academies.
- Estimated supplies have a 10% uplift on reported emissions. In 12/13 31.49% of electricity consumption and 1.7% of gas consumption was from estimated readings. This artificially inflates reported emissions.
- The winter of 12/13 was the second worst winter in 20 years.
- The rules about CRC reporting allow for no weather correction of consumption data for heating purposes.
- The Degree Days was 2,031 in 11/2 and increased 23% to 2,640 in 12/13. This indicates that an increase of approximately 23% in energy consumption for heating requirements would have been expected. Actual gas consumption increased by 24%. Actual electricity consumption rose by 1% - some electricity will have been used for heating purposes.
- 76% of emissions are from educational establishments were the Head Teachers control energy consuming behaviours equipment. WCC have no direct control over energy consumption in these properties.
- Corporate emissions will change due to property disposal and acquisition, the property rationalisation programme; works to improve the building fabric, insulation, heating, lighting and controls, increased use of IT and severity of the weather.

WCC Energy Costs 2012 / 13

'Property only' spreadsheet data for budget and actual energy spend was provided from the WCC Financial Systems Team in January 2014 showing:

- 7,249 transactions related to energy with a total value of £6,351,580.
- 3,703 transactions related to gas
- 3,271 transactions related to electricity
- Internal expenditure included smart meter payments and Salix loan repayments.
- Internal income included miscoded items; water recharges where there is no distinction between recharges for energy and water at some schools (but this is an insignificant amount compared to the total spend); and recharges for nursery's etc.
- Some of the energy cost (£14,163.24) classed as non-school on the finance spreadsheet was for schools catering and school vacant / surplus properties.

According to the financial spreadsheet:

- Calor gas was used at Kingsbury Water Park (£1,666.16) and Kingsbury Swimming Pool (£8,973.55).
- The solid fuel used was biomass for Kingsbury Water Park, North Leamington School and St. Benedict's Catholic High School.
- Corporate electricity cost was 4% less than budgeted for.
 - School electricity cost was 252% more than budgeted for.
- Corporate gas cost was 41% more than budgeted for.
 - School gas cost was 308% more than budgeted for.

- Corporate fuel oil included fuel for heating purposes (£24,224.96) and fuel for the wood chipping service (£998.69).
 - School fuel oil cost used for heating was 147% more than budgeted for.

12/13 Actual Energy Related Costs

Sum of Amount Actual			
Account(T)	Non-Schools	Schools ⁹	Grand Total
Calor Gas	10,639.71	0.00	10,639.71
Electricity	1,132,394.30	2,019,566.68	3,151,960.98
Fuel Oil	25,223.65	188,431.36	213,655.01
Gas	759,019.81	2,146,526.02	2,905,545.83
Internal Expenditure - Energy	111,174.24	-379.77	110,794.47
Internal Income - Energy		-50,869.91	-50,869.91
Solid Fuel	6,238.05	3,615.99	9,854.04
Grand Total	2,044,689.76	4,306,890.37	6,351,580.13

Table 19 Actual energy costs 12/13

12/13 Approved Energy Related Budgets

Sum of Approved Budget			
Account(T)	Non-Schools	Schools	Grand Total
Calor Gas	707.00		707.00
Electricity	1,179,333.00	574,150.00	1,753,483.00
Fuel Oil	24,391.00	76,189.00	100,580.00
Gas	539,800.00	525,473.00	1,065,273.00
Internal Expenditure – Energy	5,280.00	0.00	5,280.00
Internal Income – Energy		-35,081.00	-35,081.00
Solid Fuel	0.00	5,000.00	5,000.00
Grand Total	1,749,511.00	1,145,731.00	2,895,242.00

Table 20 Approved budget energy costs 12/13

When comparing budget against spend, schools will show an overspend due to the way energy is handled in the Financial Management System – see footnote 9.

⁹ Note on Schools Finance Information (L. McGovern, Schools Finance)

Agresso is WCC's Financial Management System (FMS) and has all of the maintained budgets on. For schools that are bank account schools and use the (Schools Information Management System) SIMS FMS as their financial system, WCC Finance Team only put a top line budget on Agresso. There would not be a budget against Gas or Electricity as the budget is not broken down to that level. However the actual spend for bank account schools who use SIMS FMS is uploaded at the end of the financial year and the spend does show against Gas and Electricity, so if one is comparing budget against spend then it will show an overspend against these headings.

WCC Energy Costs 2011 / 12

'Property only' data was provided from WCC Financial Systems Team for:

- 7,577 transactions related to energy with a total value of £5,784,454.
- 3,798 transactions related to gas
- 3,477 transactions related to electricity

Sum of Amount Actual 11/12	N/S		
Account(T)	Non-Schools	Schools	Grand Total
Calor Gas	2,186.58	-543.22	1,643.36
Electricity	1,130,878.11	2,206,158.56	3,337,036.67
Fuel Oil	31,998.16	221,263.65	253,261.81
Gas	608,252.01	1,629,655.70	2,237,907.71
Internal Expenditure - Energy	5,280.00	0.00	5,280.00
Internal Income - Energy		-73,759.99	-73,759.99
Solid Fuel	3,127.52	19,957.37	23,084.89
Grand Total	1,781,722.38	4,002,732.07	5,784,454.45

Table 21 Actual energy costs 11/12

- Non-school actual costs increased by 15% from 11/12 to 12/13.
- School actual costs increased by 8% from 11/12 to 12/13.

CRC Priority Relationships 2013

The figure below shows the priority relationships at WCC for reporting on the CRC.

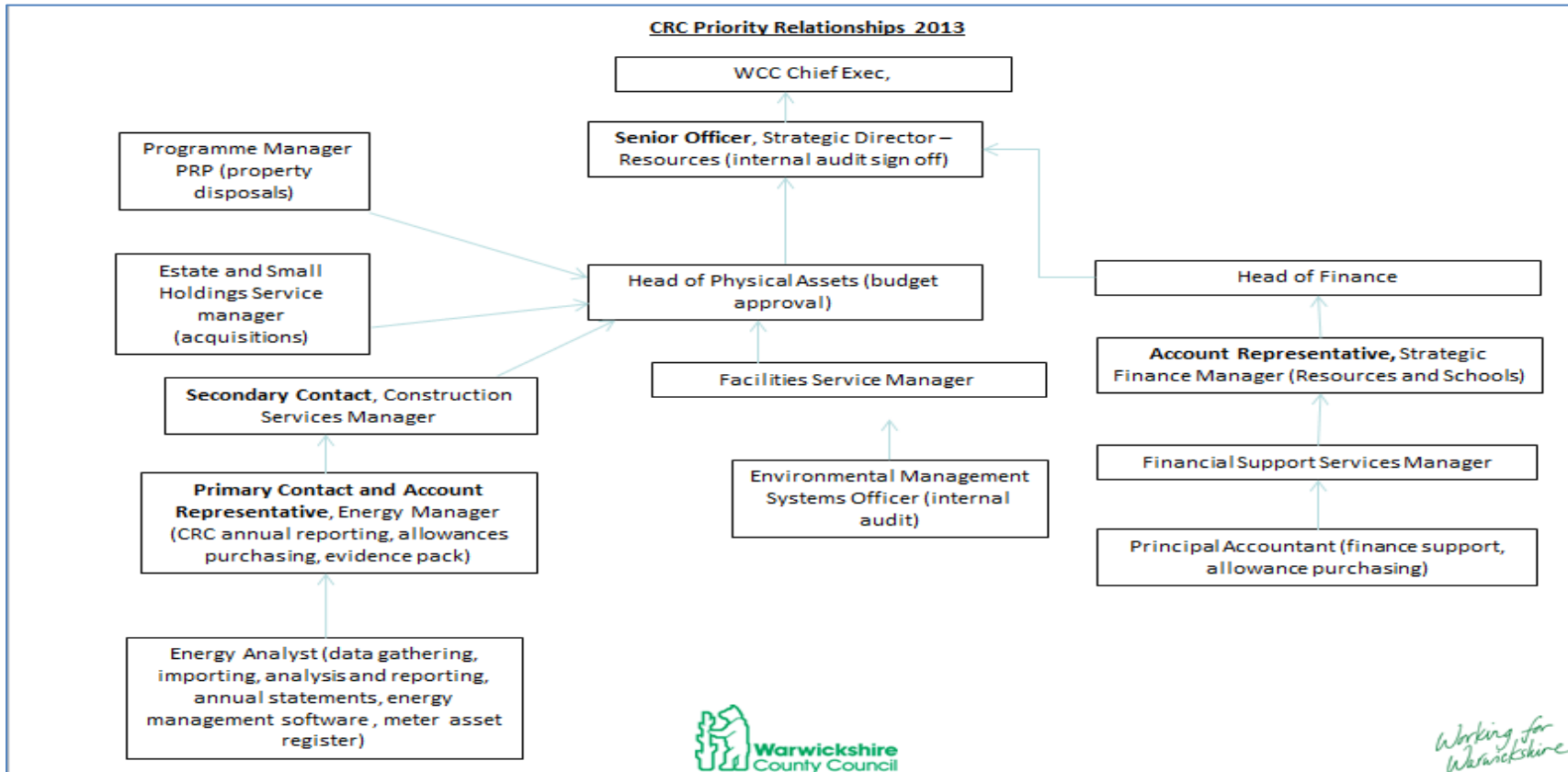


Figure 1 CRC priority relationships

Section 3: Energy Management at WCC

The WCC Energy Management function involves working with a wide range of teams across WCC. The thrust of activity derives from a regularly updated WCC Energy Policy for Properties and includes:

- Data management and resolving account queries for all properties.
- Ensuring legal compliance with climate change and energy related legislation such as the carbon Reduction Commitment (CRC-EES) and the Energy Performance of Buildings Directive (EPBD).
- Production of Display Energy Certificates (DEC's) and associated Advisory Reports (ARs) for school and corporate properties.
- Carbon and cost reduction / avoidance through on-going investment in energy efficiency projects.
- Communications and raising awareness of energy and climate change.
- The development of renewable energy systems; and
- Helping to addressing issues associated with continued delivery public services with the ever increasing energy prices and ensuring future security of energy supply.

Section 3 includes:

- Three energy project summary case studies. Further data on just the case study for Montague Road is contained within the Appendix.
- Links to the energy web pages.
- Further details about the ratings of Display Energy Certificates for WCC properties.
- A short write up on the progress on renewable energy projects; and
- A summary of the energy security work.

Summary Case Study – Premises at Montague Road, Warwick

In 2010 there was a complete replacement of gas fired boiler plant, pipework, valves main heating pump and boiler house controls at a total cost of £153,607.

Gas Consumption and Cost Savings

Monthly gas consumption and cost data for Montague Road from SystemsLink for January 2007 to December 2013 was examined (Table 1 and Graph 1), along with project data from the WCC AtlasWeb Property Database, to see what difference the works on the heating system had made to gas consumption at the property.

Prior to 2011, annual gas consumption was fairly steady at around 2.2 million kWh. Post 2010, annual gas consumption dropped to an average of around 1.1 million kWh, saving around 1.06 million kWh per year (Graph 2).

Prior to 2011, annual gas cost was around £65,505. Post 2010, annual gas cost dropped to an average of around £35,110, saving around £30,390 per year (Table 2).

Avoided Emissions of Carbon Dioxide

Prior to 2011, annual tonnes of carbon dioxide emissions from gas consumption were around 404 tonnes. Post 2010, annual tonnes of carbon dioxide emissions from gas consumption were around 210 tonnes (Table 3).

If CRC Allowances had been required for these emissions @ £12 / t CO₂ then the annual cost would have dropped from around £4,845 prior to 2011 to around £2,510.

Degree Day Data and Trend Lines

Plotting the gas consumption data against the degree day data (Table 4) and adding a trend line through regression analysis to give a straight line graph ($y=mx+c$) shows:

- No heating is required until a Degree Day value of around 25 is reached (where the straight line intercepts the degree day axis) (Graph 3).
- The data points are close to the regression line which shows that the heating system is controlled. The greater the scatter, the worse the heating control.
- Consumption in March, April and May 2013 was 117,240 kWh higher than expected meaning that the invoices were around £3,500 more than they should have been @ 2.99p/kWh (Table 5).

The Building Energy Management System

On further investigation it was found that contractors had inadvertently cut through a sensor cable for the Building Energy Management System (BEMS) in the museum stores during March 2013. Without a working sensor the default heating setting is for frost protection. This setting keeps the heating on 24/7. The sensor wiring was replaced and the controls returned to normal operation in June 2013 at a cost of £121.60.

The BEMS system enables effective management of all the heating systems connected to it ensuring they operate at maximum levels of efficiency and economy. Without the BEMS, gas consumption would not be so well managed and avoidable consumption, and therefore costs, would be far more common than they currently are.

Summary Case Study – Coten End Primary School, Warwick

Both boiler houses at the school were replaced starting in June 2011 and phased over two years. The heating distribution system and emitters were replaced with new condensing forced draught convectors and radiators. In August 2011 a new gas fired water heater was installed.

Gas Consumption and Cost Savings

Monthly gas consumption and cost data for the two meters at Coten End Primary School from SystemsLink for January 2007 to December 2013 was examined.

Prior to 2011 annual gas consumption was around 441,870 kWh. Post 2011 annual gas consumption dropped to an average of around 327,600 kWh.

Prior to 2011, annual gas cost was around £13,810. Post 2011 annual gas consumption dropped to an average of around £11,410.

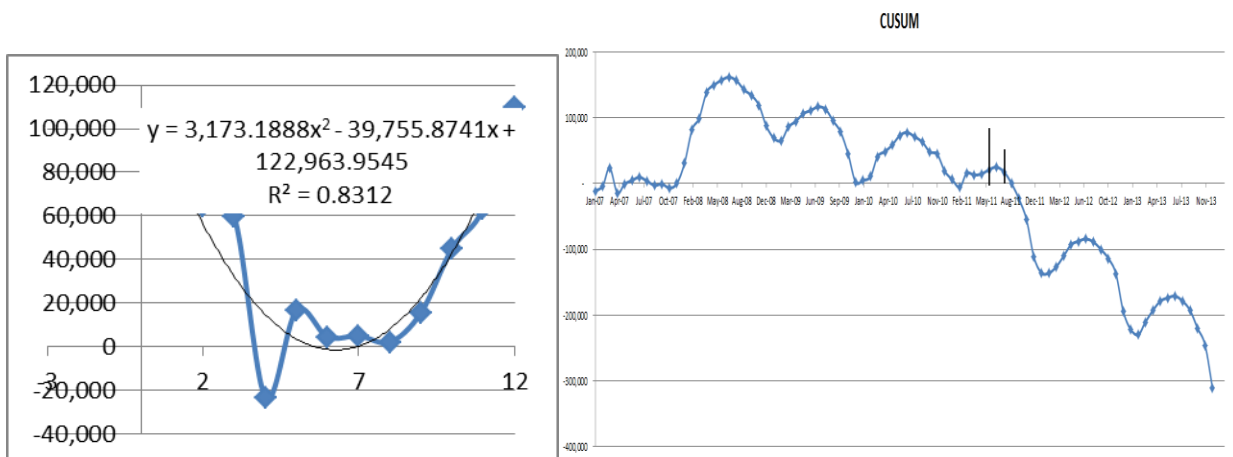
Avoided Emissions of Carbon Dioxide

Prior to 2011, annual tonnes of carbon dioxide emissions from gas consumption were around 81 tonnes. Post 2011, annual tonnes of carbon dioxide emissions from gas consumption were around 60 tonnes.

If CRC Allowances had been required for these emissions @ £12 / t CO₂ then the annual cost would have dropped from around £970 prior to 2011 to around £722.

Trend line and CUSUM

CUSUM (using only the first 12 months for the trend-line and equation, kWh on the y axis, months on the x axis) for Coten End Primary School shows that cumulative consumption is around 310,000 kWh less than predicted since the heating system was improved in 2011 saving around £12,000 at 3.88 p/kWh.



Summary Case Study – Wolvey CE Primary School, Wolvey

Between spring 2009 and October 2010 the boilers and hot water heaters at the school were replaced at a cost of around £95,000.

Gas Consumption and Cost Savings

Monthly gas consumption and cost data at Wolvey CE Primary School from SystemsLink for June 2008 to January 2014 was examined.

Prior to 2011 annual gas consumption was around 220,950 kWh. Post 2011 annual gas consumption dropped to an average of around 184,750 kWh.

Prior to 2011, annual gas cost was around £7,620. Post 2011 annual gas consumption dropped to an average of around £6,080.

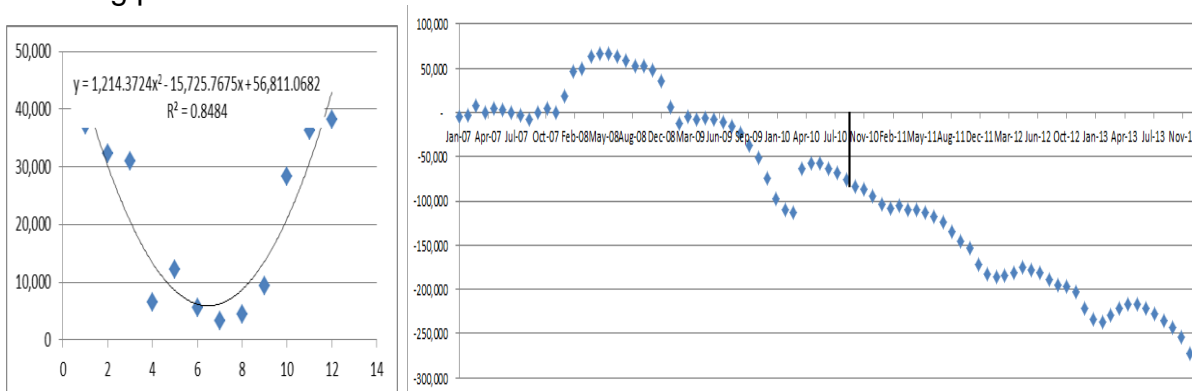
Avoided Emissions of Carbon Dioxide

Prior to 2011, annual tonnes of carbon dioxide emissions from gas consumption were around 41 tonnes. Post 2011, annual tonnes of carbon dioxide emissions from gas consumption were around 34 tonnes.

If CRC Allowances had been required for these emissions @ £12 / t CO₂ then the annual cost would have dropped from around £487 prior to 2011 to around £407.

Trend line and CUSUM

CUSUM (using only the first 12 months for the trend-line and equation, kWh on the y axis, months on the x axis) for Wolvey CE Primary School shows that cumulative consumption is around 273,000 kWh less than predicted since around September 2009 and then the heating system was improved in 2010 saving around £12,000 at 3.13 p/kWh. The chart shows when the boiler plant was not operational during the re-boiling process.



Communications - web pages

The following energy related web pages have been maintained.

Energy and Water Efficiency Service

www.warwickshire.gov.uk/energyandwater

Introduces WCC's Energy and Water Efficiency Service and the Carbon Reduction Commitment (CRC).

Energy and Water Efficiency Performance

www.warwickshire.gov.uk/energyperformance

Looks at WCC's energy reporting system and what it includes and excludes. The Systemslink database holds energy consumption and invoice data for each site.

Energy Policy/Carbon Management Action Plan

www.warwickshire.gov.uk/energypolicy

Provides links to WCC's energy policy.

[http://www.warwickshire.gov.uk/Web/corporate/wccweb.nsf/Links/277865738DFE038C802578C30052C204/\\$file/EnergyPolicyforWCCPhysicalAssetsJan2011.pdf](http://www.warwickshire.gov.uk/Web/corporate/wccweb.nsf/Links/277865738DFE038C802578C30052C204/$file/EnergyPolicyforWCCPhysicalAssetsJan2011.pdf)

Building Energy and Water Efficiency

www.warwickshire.gov.uk/energybuilding

Lists the sort of energy saving projects that have been implemented at WCC properties.

School Energy Management

<http://www.warwickshire.gov.uk/schoolenergy>

Acts as a hub for resources that will help Warwickshire schools manage their energy consumption.

Display Energy Certificates (DECs) and Advisory Reports (ARs)

In order to comply with the Energy Performance of Buildings Directive 2007 (EPBD), all buildings occupied by a public authority and frequently visited by the public with a useful floor area of over 500 m² are required to have a Display Energy Certificate (DEC).

1,000 m² + buildings need a DEC every year and an Advisory Report (AR) every seven years. Those buildings with a floor area of between 500 m² and 1,000 m² require a DEC and AR every ten years.

Energy assessors must be a member of an approved accreditation scheme. Energy assessors are responsible for conducting an energy assessment, producing a DEC and AR and lodging the DEC and AR with their accreditation scheme. The accreditation scheme is responsible for checking and lodging certificates on the national register. Accreditation schemes are also responsible for monitoring the quality of the certificates energy assessors produce. WCC produce DECs / ARs through the accreditation bodies Stroma and Elmhurst.

A DEC provides an overview of the energy performance of a building based upon its actual recorded energy consumption (electricity, gas, heating oil, biomass, solid fuel) and the CO₂ emissions that result from that energy use. This is shown as a rating from A to G, where A has the lowest CO₂ emissions (best) and G the highest CO₂ emissions (worst). The rating is also shown as a number. A typical building of its type would have a rating of 100. A building with twice the typical CO₂ emissions would have a rating of 200 (or G).

DECs have to be displayed in a prominent place and are intended to raise public awareness of energy use and to provide the public with energy efficiency information about a building they are visiting.

Non-dwellings are responsible for almost 20 per cent of the UK's energy consumption and carbon dioxide (CO₂) emissions. The Government want the public service sector to lead the way in the campaign to tackle CO₂ emissions.

The DEC must be displayed in colour at A3 size in a prominent place, usually the main entrance area.

Over the last few years, WCC have been trying to manage the process of spreading DEC production over the whole year rather than have them all expiring during the same two month period. WCC need to produce around 300 DECs per year. The number of Display Energy Certificates (DECs) in date or out of date changes on a daily basis.

Floor Areas

Accurate floor areas are needed in the production of a DEC. WCC have a property database called AtlasWeb. All dimensions / floor areas within AtlasWeb are generated from the CAD floor plans. AtlasWeb contains digitised CAD floor plans for properties built pre mid 1990's which were created from hard copy scaled drawings.

Measurements were also taken on site for a sample of properties to ensure accuracy and the plans were found to be within 5% of site. For properties built post mid 1990's

the CAD plans are from the as-built CAD drawings provided by the Design and Major Projects Team.

Floor area may change from original CAD plans by a few meters each year with changes in internal wall space, such as knocking two rooms into one and splitting one room into two.

Validation of accuracy of the CAD Plans is based on information received from site visits and the following sources:-

- Condition Surveys
- Notification of completion of design projects via Design and Major Projects
- Notification of completion of design projects via Building Surveyors
- Direct from the property
- Energy Surveys

Site Visits

The floor areas in AtlasWeb are not always directly compatible with producing a DEC as it can show buildings as being connected based on roof space. DEC regulations state that buildings are classed as separate if they are connected by an unconditioned walkway (not heated at all).

Buildings connected by a conditioned (heated) walkway are counted as a single building for the purposes of producing a DEC. AtlasWeb can show buildings connected by an unconditioned walkway as a single building. Because of this it is not always clear how many separate DECs are required until a site visit is carried out. Information gathered during site energy assessments is logged into a DEC scheduling tool so that information for renewals continuously improves.

WCC DEC Related Targets

WCC aims to produce an average of 20-30 DECs per month depending on whether they are simple renewals or new DECs, when the renewal date occurs during the year and whether all the required data is available. An average of 24 DECs are required for schools or academies per month and 4-5 corporate DECs. WCC also produce an average of 10 ARs per month, 7-8 school/academy ARs and 2-3 corporate ARs.

Between 1st April 2012 and the end of February 2013 (11 months), WCC produced 283 DECs and 56 ARs.

WCC uses the % DEC rating of its E, F and G rated properties across the whole estate as a quarterly performance reporting measure, with the target of maintaining the percentage of E, F and G rated DECs at below 30.6% of all valid DECs..

WCC expects the average DEC rating to improve over time: as the quality of the data improves; as inefficient properties are disposed of through property rationalisation and as more investment is made in energy efficiency in the properties that are retained.

Percentage (%) of DEC's Rated as E, F or G

DECs										
Year	08/ 09	%	09 / 10	%	10 / 11	%	11/ 12	%	12 / 13	%
Completed	3	1.4%	3	1.3%	1	0.5%	1	0.3%	4	2.9%
In progress	17	7.7%	7	3.0%	2	1.1%	0	0.0%	0	0.0%
Submitted	202	91.0%	224	95.7%	187	98.4%	287	99.7%	133	97.1%
Total	222	100%	234	100%	190	100%	288	100%	137	100%
<i>Export from the OR Toolkit on 27th March 2013</i>										
DEC Rating										
A (0 – 25)	0	0.0%	0	0.0%	0	0.0%	3	1.0%	1	0.7%
B (26 – 50)	10	4.9%	7	3.1%	4	2.1%	6	2.1%	5	3.6%
C (51 – 75)	54	26.3%	39	17.2%	42	22.5%	55	19.1%	30	21.9%
D (76 – 100)	99	48.3%	107	47.1%	93	49.7%	132	45.8%	60	43.8%
E(101 – 125)	29	14.1%	59	26.0%	37	19.8%	72	25.0%	34	24.8%
F(126 – 150)	7	3.4%	7	3.1%	8	4.3%	16	5.6%	7	5.1%
G(Over 150)	6	2.9%	8	3.5%	3	1.6%	4	1.4%	0	0.0%
Total E,F and G		20.4%		32.6%		25.7%		32%		29.9%
Total	205	100%	227	100%	187	100%	288	100%	137	100%

Table 22 DEC Ratings 2008 - 2013

DEC Ratings – snapshot in time

DEC Rating	Number as of July 2011	%	Number as of Nov 2012	%	Number as of end May 2013	%	
A	1	0.40%	2	0.70%	1	0.61%	Decrease
B	7	2.50%	8	2.70%	6	3.68%	Increase
C	55	19.40%	65	21.90%	33	20.25%	Decrease
D	134	47.20%	131	44.10%	68	41.72%	Decrease
E	65	22.90%	72	24.20%	38	23.31%	Decrease
F	15	5.30%	14	4.70%	17	10.43%	Increase
G	7	2.50%	5	1.70%	0	0.00%	Decrease
Total	284	100%	297	100%	163	100%	

Table 23 DEC ratings over time

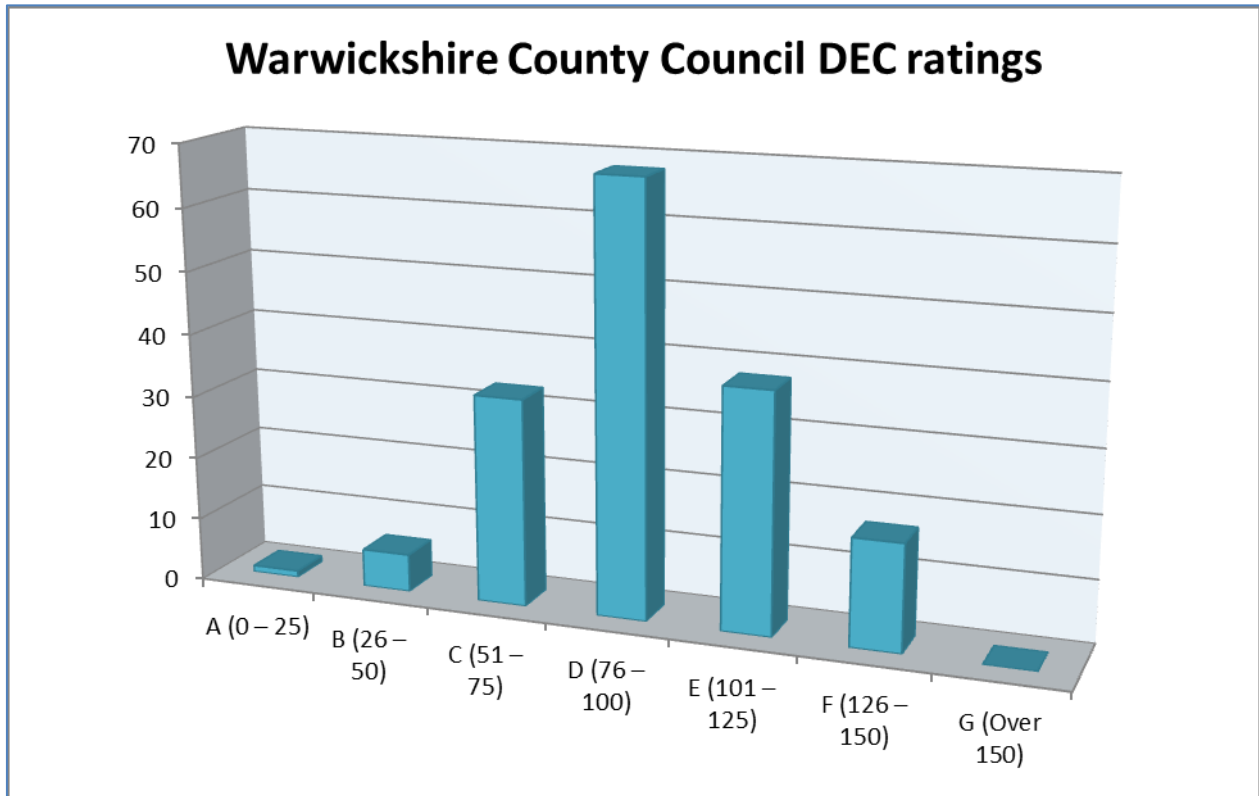


Figure 2 163 DECs shown by rating

This figure is of 163 DECs shown by rating - for DECs with a nominated date of between November 2011 and September 2013 as at the end of May 2013.

Renewable Energy 12 / 13

The key project during the year was exploring the viability of a 100kW Anaerobic Digester (AD) project on one of WCC's small holdings.

An AD plant in essence takes slurry waste from (in this case) a dairy herd, mixes it with chopped up organic matter (such as maize fodder crop) in a controlled environment to generate methane gas which is then burnt to generate electricity.

A 100kW plant could generate nearly 900,000kWhrs of electricity over a year – the financial analysis showing an annual return of 11.3% on the investment made. Based on 'conservative' budget figures this would amount to a profit of around. £20,000 after life-cycle costs have been taken into account - every year for twenty years (and more if the price of electricity rises faster than other costs). This is in addition to a range of social and environmental benefits including substantial CO₂ savings.

The specific project is unable to proceed at present due to unrelated issues – but the work done has given the confidence to proceed with an overview of the potential on other farms with the aim of further improving the return to the Council from the Small Holdings Estate.

Such projects are likely to be undertaken on an entrepreneurial basis in partnership with tenant farmers – using their knowledge, skills and farming experience along with WCC's finance and project management – sharing risks and rewards accordingly.

Other projects have included development of three PV projects on farm barns (subsequently delivered in 2103-14). For the first time, WCC has developed and entered in to agreements with the farmers for them to purchase the electricity generated and used on site at a discount to their normal costs. Every project cost is different (on-site circumstances) – the annual rates of return for the three projects range from 4% to 10.24% - and CO₂ savings totalling 5.95 tonnes /yr.

It is hoped the power purchase agreement developed for working with farm tenants will be the basis of agreements with schools and business tenants in future.

Longer Term Energy Security 2010 - 2013

Energy prices seem to be constantly on the rise – and in the UK as elsewhere the issues (i.e. 'excess' profits, delays in replacing worn out infrastructure, the costs of nuclear - against fossil fuels - against renewables, fracking, whether energy is actually too cheap) have become highly contentious – and are now at the centre of national political debate. Not unusually it's difficult to know who's right.

As well as understanding the mix of energy used in the UK now and arguments about the future mix [to planned for] – there's a big global debate between those saying plenty of fossil energy to be had - and those suggesting scarcity and much high prices.

Since 2010 Resources Group and Corporate Board have supported a low key exploration of the macro / longer term issues of where the energy enabling our prosperity and lifestyle will come from and how much it'll cost. This is seen as

important, not just in relation to corporate energy costs, but for household and business costs – our customers. It is also not just in relation to direct power, heating and transport costs, but includes the embedded cost of energy and chemicals in almost every product around us.

The work was stimulated in part by the impact of the 2008 oil price spike and more recent suggestions from the International Monetary Fund that oil prices could again spike by 2022 to over \$200 barrel with serious consequences for everyone.

For further information on this work including power point presentations and the most recent report (on a series of risk management workshops) to Corporate Board in July 2013 please go to the following web link and scroll down to the bottom of this web page for the most recent papers on 'Expensive energy ... it's a people thing':

<http://www.warwickshire.gov.uk/energypolicy>

Appendix 1: Full Data for Case Study – Premises at Montague Road, Warwick

Montague Road Data – tables and graphs of energy consumption and carbon dioxide emissions

Month	2007	2008	2009	2010	2011	2012	2013
	kWh	kWh	kWh	kWh	kWh	kWh	kWh
Jan	179,673	543,065	303,480	362,023	206,969	177,794	208,492
Feb	191,630	461,031	261,493	614,533	113,526	181,257	182,635
Mar	166,977	244,451	231,591	402,046	133,359	130,841	284,086
Apr	102,299	150,931	173,635	144,344	64,668	110,939	182,377
May	68,190	102,483	141,292	97,169	448	66,532	147,069
Jun	32,184	4,754	55,246	6,451	0	424	7,442
Jul	20,526	324	31,344	1,914	0	122	0
Aug	26,496	0	4,138	1,971	0	0	0
Sep	53,941	28,069	4,004	5,753	11	26,436	31,558
Oct	266,177	214,582	275,971	104,082	72,870	120,105	87,180
Nov	299,343	233,840	332,333	172,055	128,384	145,621	125,085
Dec	698,142	273,110	427,893	281,453	165,859	176,797	144,485
Total	2,105,578	2,256,640	2,242,420	2,193,794	886,094	1,136,867	1,400,409

Table 24 Montague Road Gas Consumption

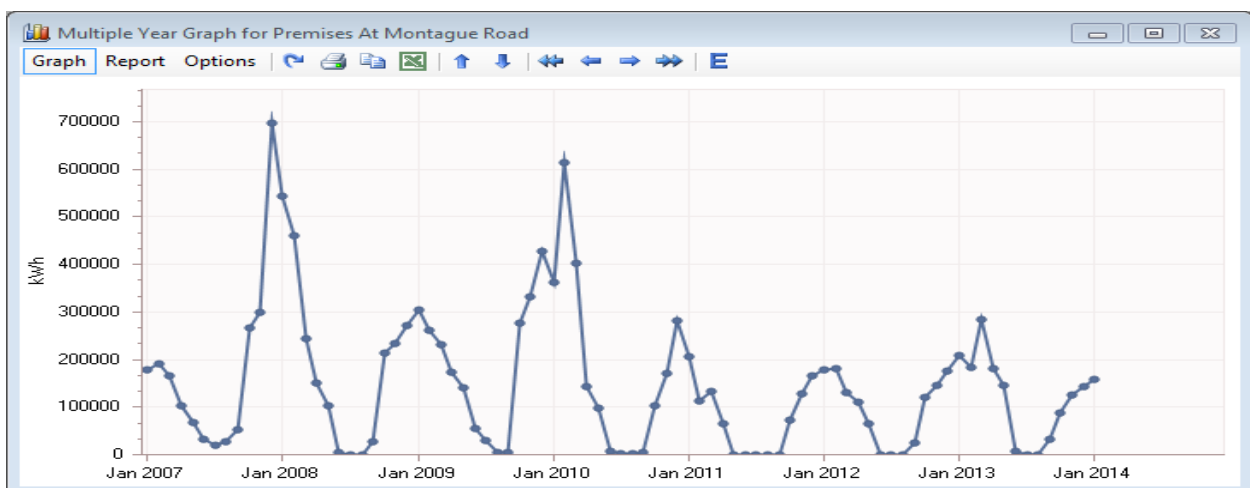


Figure 3 Montague Road 12 monthly gas consumption from Jan 2007 to Dec 2013

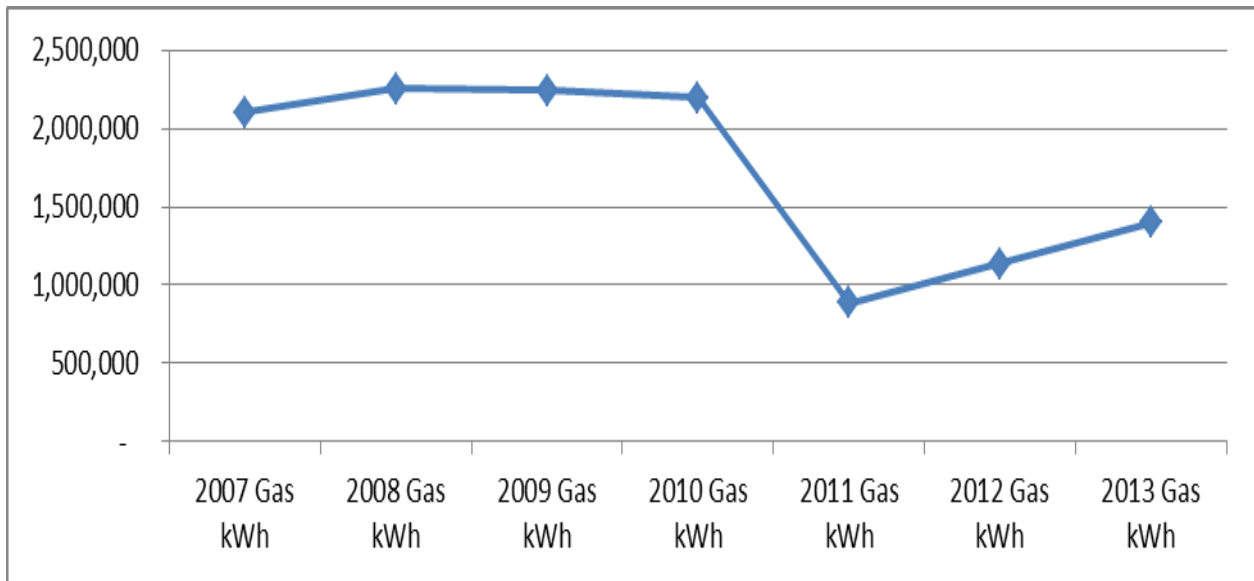


Figure 4 Montague Road total annual gas consumption from 2007 to 2013 showing the drop in consumption after the heating system works in 2010

Carbon Dioxide Data

Month	2007	2008	2009	2010	2011	2012	2013
	t CO ₂	t CO ₂	t CO ₂	t CO ₂	t CO ₂	t CO ₂	t CO ₂
Jan	33	100	56	66	38	33	38
Feb	35	85	48	113	21	33	34
Mar	31	45	43	74	24	24	52
Apr	19	28	32	27	12	20	33
May	13	19	26	18	0	12	27
Jun	6	1	10	1	0	0	1
Jul	4	0	6	0	0	0	0
Aug	5	0	1	0	0	0	0
Sep	10	5	1	1	0	5	6
Oct	49	39	51	19	13	22	16
Nov	55	43	61	32	24	27	23
Dec	128	50	79	52	30	32	27
Total	387	414	412	403	163	209	257
Value @£12 per tonne CO₂	£ 4,639	£ 4,972	£ 4,940	£ 4,833	£ 1,952	£ 2,505	£ 3,085

Table 25 Montague Road carbon dioxide emissions data

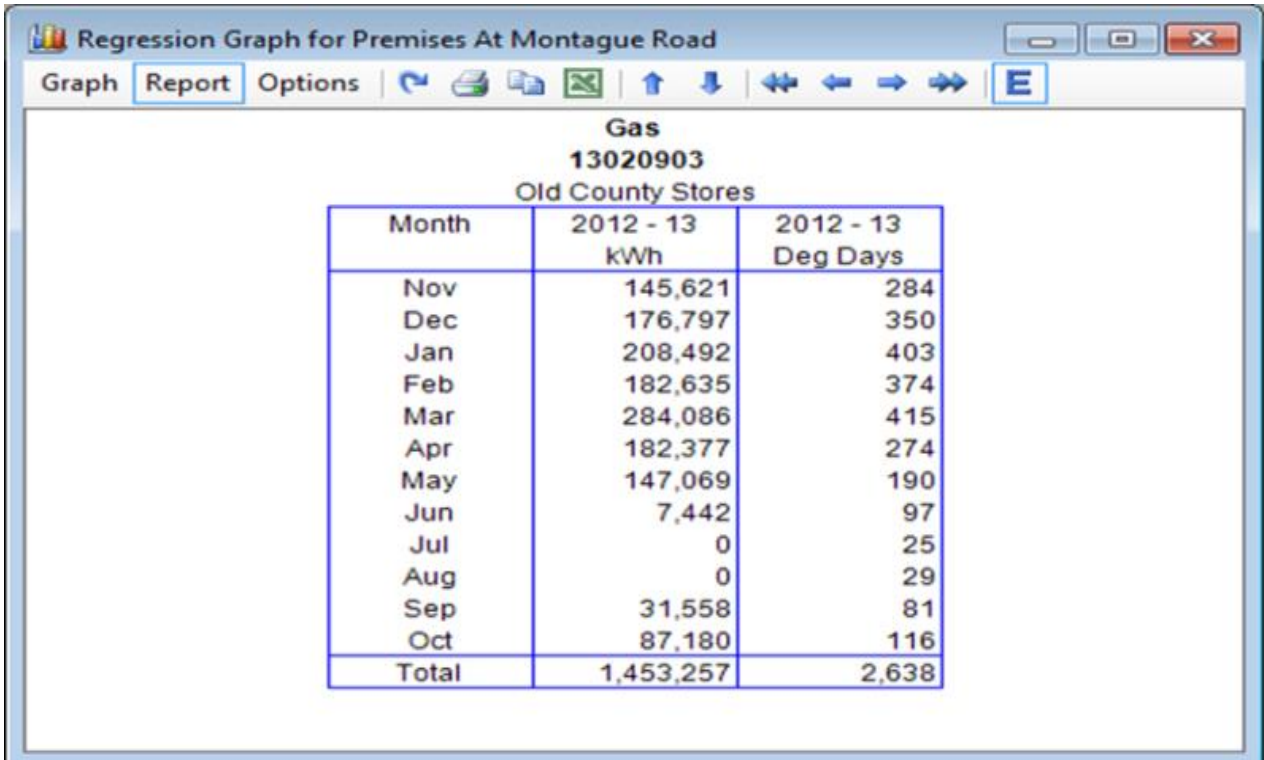


Table 26 Montague Road degree day data

Montague Road - Actual Consumption v. Expected Consumption

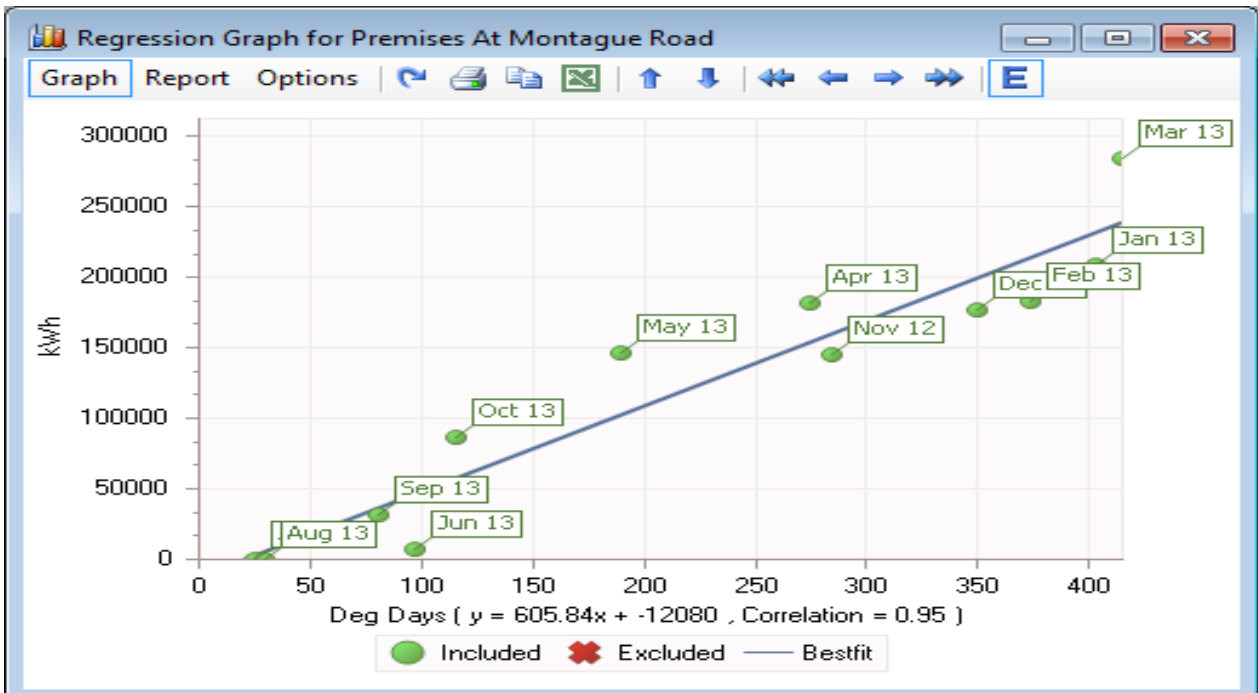


Figure 5 Montague Road gas consumption v. Degree Day Data

The R² value (Correlation) = 0.95 showing a very good fit.

The calculation for predicted energy consumption represents the expected consumption if nothing in the building changes. The difference between the predicted and actual consumption shows the departure from the normal pattern of use. Adding the differences month on month gives a cumulative sum of difference or CUSUM.

$y = (605.84 * \text{degree day data}) + (-12080)$			
Month	2012-13 gas Consumption kWh	Calculated consumption kWh	Deviance from expected
Nov	145,621	159,979	-14,358
Dec	176,797	199,964	-23,167
Jan	208,492	232,074	-23,582
Feb	182,635	214,504	-31,869
Mar	284,086	239,344	44,742
Apr	182,377	153,920	28,457
May	147,069	103,030	44,039
Jun	7,442	46,686	-39,244
Jul	-	3,066	-3,066
Aug	-	5,489	-5,489
Sep	31,558	36,993	-5,435
Oct	87,180	58,197	28,983
Total	1,453,257	1,453,246	11

Table 27 Montague Road actual consumption v. calculated consumption

Montague Road - Cumulative Sum (CUSUM)

CUSUM is a statistical analysis techniques used for monitoring energy consumption data so that changes in operation can be detected. Taking the cumulative sum of differences between actual and calculated energy consumption can reveal longer term trends and changes that are occurring in the energy performance of a building.

CUSUM (using the first 12 months for the trend-line and equation) for the premises at Montague Road shows:

- From December 2007 to June 2010 there was a rising upward trend which shows that the consumption was more than expected (persistent energy waste).
- From June 2010 there was a decreasing downward trend which shows that the consumption is persistently less than predicted (at December 2.5 million kWh less than predicted since the heating system was improved in 2010 saving around £83,890 at 3.33 p/kWh).

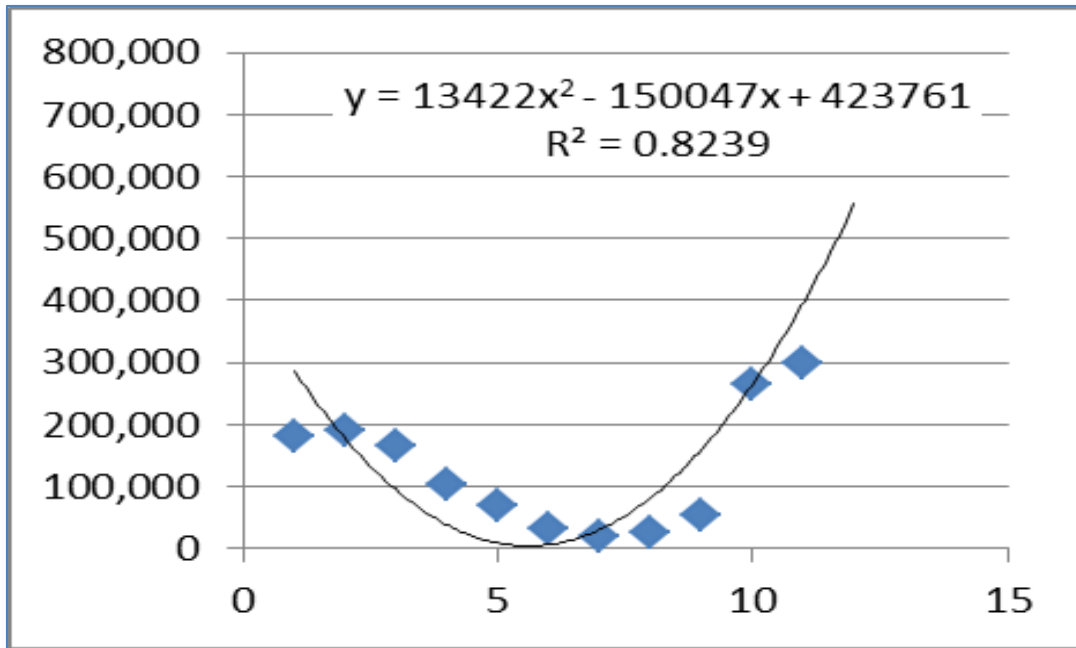


Figure 6 Montague Road trend line – gas consumption

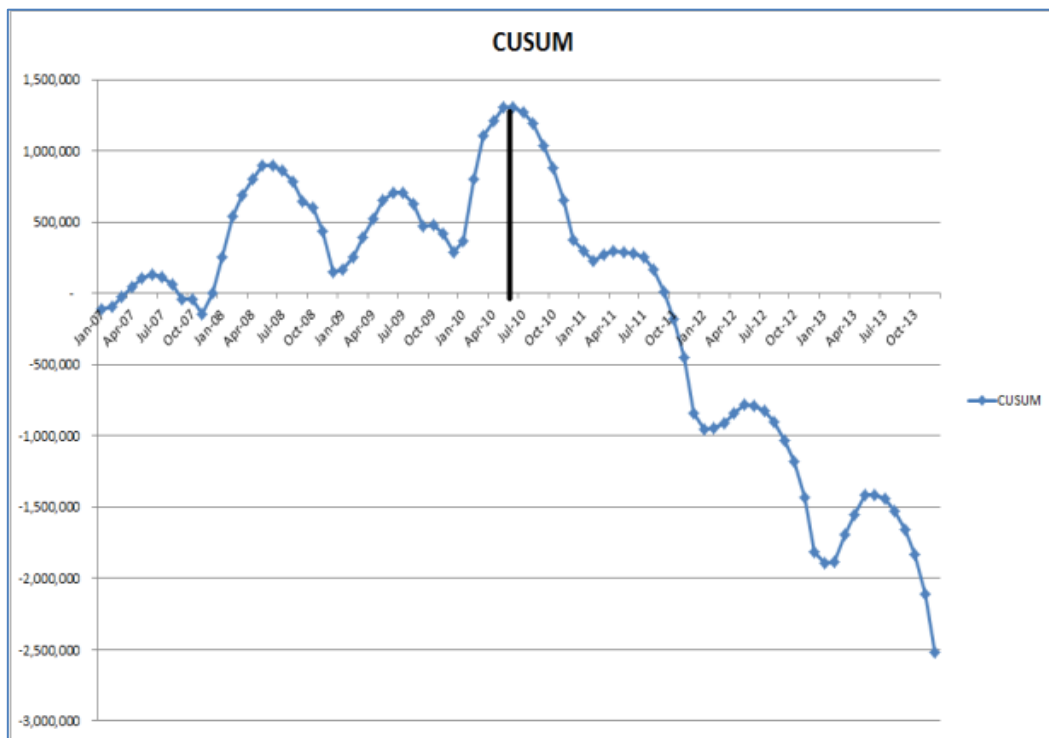


Figure 7 Montague Road Cumulative Sum of Difference (CUSUM) - gas consumption

Appendix 2: Performance Indicators and Benchmarks

Benchmarks for smaller buildings may not necessarily be the same ones as for large buildings, even though the buildings may be used for the same purpose. Benchmarks are only a guide to help more fully understand energy performance of a building – not an exact indication of either good or poor performance.

Electricity consumption per unit of floor area (kWh / m²)

The most frequently occurring electricity consumption fell between 35 kWh/m² and 65 kWh/m².

The average for all sites was 62 kWh/m².

Electricity consumption per square metre of floor area in WCC properties ranged from 1 kWh/m² to 1,418 kWh/m².

The following properties (in the table below) had more than a 30% change in electricity kWh/m² since last year's CRC Report and therefore needed further investigation to find out the reasons for this.

Some of these properties had estimated rather than actual or customer meter reads giving misleading or inaccurate data, some were disposed of through the Property Rationalisation Programme (PRP).

Investigations of Electricity Consumption per m²

UPRN	Site Name (Electricity consumption kWh per m ²)	12-13 kWh / m ²	11-12 kWh / m ²	Increase / Decrease on 11-12	Notes
2017	The Ratcliffe Youth & Community Centre	108	3	3797.57%	No meter reading since 29/9/09. No estimate data since 19/7/13. 99 year lease expired; landlords are Governors of Queen Elizabeth School.
5295	The Lawns Home For Elderly People	51	6	815.72%	Last meter reading and invoice on 21/1/13. Disposed of to Runwood Homes Ltd. on 21/1/13. WCC responsible only for broadband wireless link equipment.

UPRN	Site Name (Electricity consumption kWh per m ²)	12-13 kWh / m ²	11-12 kWh / m ²	Increase / Decrease on 11-12	Notes
2129	Hayes Country Park	244	35	588.77%	Meter read and last invoice on 7/8/13. Estimates of 13049 kWh on 15/2/13 and 9/11/12 (H).
5339	Coten End Primary School	36	8	332.96%	Last meter reading and invoice 1/8/13, estimate on 26/7/11 of 157253 kWh (H).
4099	Henley in Arden Highways Sub-Depot	143	55	161.29%	Last meter reading and invoice 24/8/13. Balfour Beatty occupying Letting No.2.
3085	Oakfield Primary School	99	39	155.81%	Last meter readings: 12/4/13 for Children's Centre & Swimming Pool invoice 15/7/13, 30/11/13 for new meter on the Sunesis build (invoice also) and 15/7/13 for Oakfield Primary (invoice also). Reading of 433 kWh on 1/11/12 for Oakfield Primary (L).
5092	Whitnash Nursery School	65	26	145.79%	Last meter reading and invoice 1/8/13, reading on 11/11/09 of 12788 kWh. (H)
3008	Binley Woods Primary School	51	21	146.30%	Last meter reading & invoice on 1/9/13.
3075	Rokeby Infant School	25	11	133.77%	Last meter reading and invoice 1/9/13. Infant school merged onto Junior site to form Primary School building occupied by adhoc guardians 7/6/12. Readings of under 3,000 kWh between 8/4/11 and 1/6/12. Readings of over 10,000 kWh between 29/11/12 and 30/8/13.
5242	Youth and Community Office	38	16	135.18%	Last meter reading and invoice 19/7/13. Estimate on 13/7/12 of 15738 kWh, reading on 14/7/11 of 15208 kWh (both H).
3051	The Avon Valley School & Performing Arts College	74	32	128.99%	Last meter reading & invoice on 30/11/13.

UPRN	Site Name (Electricity consumption kWh per m ²)	12-13 kWh / m ²	11-12 kWh / m ²	Increase / Decrease on 11-12	Notes
3086	St Marie's Catholic Junior School	74	33	124.85%	Last meter reading 16/4/13 last invoice 17/7/13, school due to amalgamate with infant school to form primary school September 2011. Schools to remain separate until a single site can be built.
4188	Southam and Shipston Children's Team	44	21	113.02%	Last meter reading and invoice 29/4/13, vacated 31/12/12. No longer the responsibility of WCC.
1018	Race Leys Infant School	43	21	101.97%	Last meter reading on 1/9/13 for both the infant school and Pre-School. Meter reading of 22498 kWh on 3/5/11 for the Infant School (H). Meter reading of 54876 kWh on 1/12/11 for the pre-school (H).
5405	Ridgeway School	60	31	95.13%	Last meter reading and invoice on 28/2/13. Reading of 8408 kWh on 1/9/11 (L).
5026	Kenilworth School and Sports College - Castle Hall	42	23	85.15%	Last meter reading and invoice on 11/9/13 for Castle Hall and the Old Caretaker's bungalow. Meter reading of 39 kWh on 18/7/12 for Castle Hall (L). Reading of 1065 kWh on 11/3/13 for the Caretaker's Bungalow (H).
4305	Wellesbourne Library & Information Centre	53	29	80.28%	Last meter reading 11/6/13 Library & Children's Centre last invoice 10/9/13 and 17/6/10 for Library. Latest invoice for the Library is an estimate of 0 kWh on 28/6/10
5037	Clinton Primary School	66	37	79.90%	Latest meter reading and invoice 1/10/13.
5340	Lillington Primary School	41	24	72.35%	Last meter reading 21/2/13 for Lillington Nursery and 16/5/13 for Lillington Primary. Latest invoice 20/8/13 for Nursery & 16/8/13 for Primary. A reading of 93810 kWh taken on 9/2/12 for

UPRN	Site Name (Electricity consumption kWh per m ²)	12-13 kWh / m ²	11-12 kWh / m ²	Increase / Decrease on 11-12	Notes
					Primary (H). An estimate of 0 kWh was made on 1/10/09 for the Nursery.
1021	Bedworth Heath Nursery School	82	48	71.65%	Latest reading and invoice 1/10/13. Estimate of 16001 kWh on 19/7/11 (H).
3225	Wolston Library & Information Centre	137	79	72.68%	Latest reading and invoice 8/10/13, estimate of 32148 kWh on 8/1/10 (H).
1146	Chetwynd Junior School	34	21	63.52%	Latest reading and invoice 1/8/13. Reading of 30479 kWh on 1/5/12 and 46488 on 4/5/11 (Both H).
4084	Harbury Library & Information Centre	43	27	59.36%	Last reading and invoice 31/3/12. Equipment only. Disposed of 30/1/13.
4204	Shipston Highways Sub-Depot	74	46	59.29%	Latest reading and invoice 19/9/13. Garage let to Shipston Town Council who is responsible for internals.
3044	Long Lawford Primary School	34	22	57.27%	Two separate data sets with the same reference number. Last meter reading 1/11/12 for children's centre, 4/2/13 for Long Lawford Primary School and 3/5/13 for the same. Last invoice on 31/7/13 for all. Reading of 0 kWh on 5/7/12 for the Primary school.
1125	Whitestone Infant School	36	23	55.77%	Latest reading and invoice 1/8/13. Stepping Stones Nursery is responsible for T/C 321.
5291	Whitnash Primary School	32	21	54.90%	Last reading and invoice on 16/7/13.
4235	Burton Farm Landfill Site & Household Waste Facility	178	114	56.26%	Latest reading and invoice 1/10/13.
3079	Henry Hinde Infant School	40	27	46.24%	Last reading 29/4/13 latest invoice 29/7/13. Ground leased to TLC Day Nursery. Converted

UPRN	Site Name (Electricity consumption kWh per m ²)	12-13 kWh / m ²	11-12 kWh / m ²	Increase / Decrease on 11-12	Notes
					to Academy 1/4/12.
2225	Kingsbury Primary School	50	34	45.65%	Latest reading for meter 1) 19/12/12 and latest invoice 30/9/12. Also a reading of 34847 kWh on 25/6/12 and 23943 kWh on 30/9/11 (Both H). Last reading and invoice on meter 2) 30/11/13.
5058	Kenilworth Fire Station	92	63	45.05%	Last reading and invoice 2/10/13. Reading of 10050 kWh on 25/9/12 and 11006 kWh on 26/9/11 (Both H).
1198	Ramsden Resource Centre	47	33	42.26%	Last reading and invoice 1/10/13. Readings of 11612 kWh on 1/4/13 and 12040 kWh on 1/1/13 (Both H).
2209	Birchwood Primary School	40	28	42.20%	Latest reading 30/11/09 at Polesworth Children's Centre and latest invoice on 7/12/09. Latest reading and invoice on 11/10/13 for Birchwood Primary School. Academy status on 1/11/12.
5106	(S.T.E.P.S.)	59	42	41.38%	Last reading 18/8/11 and invoice 21/8/13. Estimates increased by about 2000 kWh after 18/8/11.
4199	Shipston Fire Station	52	38	36.77%	Last meter reading 13/2/13 and invoice 15/8/13. Readings of 4492 kWh on 13/2/13 and 4749 kWh on 17/2/12 (Both H).
3016	Clifton upon Dunsmore CE Primary School	78	57	36.56%	Last reading and invoice 1/10/13.
5228	Woodloes Community Primary School	47	35	35.58%	Last reading and invoice 1/10/13, reading of 34046 kWh on 17/12/12 (H).
1140	St Thomas More Catholic School	44	32	36.07%	Last reading and invoice 30/11/13 for the School building. Readings of 7873 kWh on 31/8/13 and

UPRN	Site Name (Electricity consumption kWh per m ²)	12-13 kWh / m ²	11-12 kWh / m ²	Increase / Decrease on 11-12	Notes
					8548 kWh on 31/8/12 (Both L). Last meter reading for 6 th form building 1/8/13 and invoice 11/11/13.
1108	St Paul's CE Primary School	53	40	32.81%	Latest reading and invoice 1/10/13.
2214	Pooley Fields Heritage Centre	182	137	32.61%	No energy data on SystemsLink what so ever. Part of the site sub-let to adjoining occupiers of Europa works.
1132	Park House Youth Centre & Area Youth Office	19	27	-28.93%	No longer WCC's responsibility. Last reading 14/9/12 last invoice 23/9/13.
5195	Field Archaeology Office & Museum Stores	18	25	-29.31%	No longer WCC's responsibility contract exchanged 20/11/12. Last reading and invoice 1/8/13.
5124	Fire & Rescue Service Headquarters	101	147	-31.11%	Last reading and invoice 1/12/13. Reading of 0 kWh on 6/12/12.
1184	Nuneaton Fire Station	8	12	-30.93%	Last reading and invoice 26/9/13. Reading of 11297 kWh on 24/3/11 (H).
1161	Nuneaton Area Library	13	20	-33.97%	Last reading and invoice 25/9/13. Readings of 12447 kWh on 22/3/12 and 13702 kWh on 25/3/11 (Both H).
1127	Manor Park Community School	20	30	-33.27%	Two separate data sets with the same reference number. 1 st : Last reading and invoice 31/10/13, reading of 0 kWh on 3/10/11. 2 nd : Last reading 12/8/13 and invoice 26/9/13. Readings of 0 kWh on 12/8/13, 13/5/13, 10/8/12, 24/9/10, 28/6/10.
1141	Abbey C E Infant School	69	103	-33.06%	Last reading and invoice 12/9/13 for the Integra Unit, a reading of 22394 kWh was made on

UPRN	Site Name (Electricity consumption kWh per m ²)	12-13 kWh / m ²	11-12 kWh / m ²	Increase / Decrease on 11-12	Notes
					14/3/13 (H). Last reading and invoice 1/9/13 for the Infant School.
2047	Bracebridge Court Home For Elderly People	62	92	-32.50%	Disposed of 21/1/13. Last reading and invoice 21/1/13.
3105	Northlands Primary School	27	42	-35.25%	Latest reading and invoice 5/9/13.
4194	Shipston Library & Information Centre	21	33	-35.72%	Latest reading and invoice 13/8/13. Reading of 58 kWh on 14/2/13 (L).
5190	Judge's House	62	99	-37.08%	Grade 2 listed. Last reading and invoice 18/7/13.
1080	Warwickshire Pupil Reintegration Unit, The Keresley Centre	21	34	-37.59%	No meter data available. Site unoccupied?
4232	Tyler House	20	33	-38.69%	Lease surrendered 15/12/11. Last meter reading and invoice 17/9/13.
2171	Polesworth Fire Station	58	100	-41.90%	Last reading and invoice 7/10/13. Estimate of 10382 kWh on 7/7/11 (H). Reading of 650 kWh on 10/10/11 (L).
5074	North Leamington School	65	114	-43.10%	Last reading and invoice 03/9/12.
1028	All Saints CE Infant School	31	55	-44.13%	Two data sets with the same reference number. Last reading and invoice for #1 12/6/13, it is a 0 kWh reading as were the two previous. Last reading and invoice for #2 1/9/13, same story as the first one.
4268	St. Mary's Catholic Primary School	60	109	-44.87%	Latest reading and invoice 1/8/13. Estimate of 5001 kWh on 20/9/11 (L).
5253	Priory House	16	29	-45.17%	Last reading 8/1/13, last invoice 14/10/13.
1034	Bedworth Heath Branch	19	34	-44.93%	Library vacated 31/12/11, declared surplus,

UPRN	Site Name (Electricity consumption kWh per m ²)	12-13 kWh / m ²	11-12 kWh / m ²	Increase / Decrease on 11-12	Notes
	Library				occupied by Bedworth Heath Nursery and Children's Centre. Last meter reading 17/4/13 last invoice 15/4/13. Readings of 0 kWh on 16/1/13 and 24/4/12.
5265	Park View Home For Elderly People	41	76	-45.77%	Disposed of 21/1/13. Last reading and invoice 21/1/13.
5233	Myton School (Foundation)	60	113	-46.91%	Academy status 1/7/11. Latest meter reading and invoice 30/9/12.
4173	Southam College	62	117	-47.18%	Last reading and invoice 30/9/12.
5036	Burton Green C E Primary School	44	85	-47.95%	Last reading and invoice 1/8/13.
4090	River House School	55	108	-49.10%	Last reading and invoice 21/8/13 of 20190 kWh, previous 5714 kWh on 31/5/13. Only the two invoices.
3146	Abbotsbury Home For Elderly People	34	70	-51.61%	Last reading and invoice for the HEP 15/4/13 no data for warden's bungalow. Site sold to Housing 21 18/3/13.
4314	Wooton Wawen C.E. Primary School	85	176	-51.72%	Latest reading and invoice 16/9/13. Readings of 0 kWh on 6/3/12 and 29/11/11. Estimate of 5695 kWh on 20/12/12 (L).
2210	Social Services Vehicle Depot	7	14	-50.06%	Let to Coach Built GB Ltd. Latest meter reading and invoice 22/11/13.
1062	Mayfield Home For Elderly People	26	56	-53.19%	Last reading and invoice 22/4/13.
5245	The Old Clink	16	36	-55.46%	Last reading and invoice 8/7/13. Reading of 743 kWh on 16/7/12. Estimate of 869 kWh on 16/7/12. (Both L).

UPRN	Site Name (Electricity consumption kWh per m ²)	12-13 kWh / m ²	11-12 kWh / m ²	Increase / Decrease on 11-12	Notes
4231	Shottery St Andrew's C.E. Primary School	60	134	-55.13%	Last reading and invoice 4/9/13.
2056	Baddesley Ensor Branch Library	30	124	-75.84%	Library vacated 5/4/12, let to Monkey & Menace Ltd. Latest reading and invoice 7/12/12.
1083	Keresley Newland Branch Library	13	120	-89.20%	Lease to community group 4/5/12. No data available on SystemsLink.
5232	Ridgeway School	2	24	-91.62%	Pending disposal following school closure on 1/11/10. Last meter reading 4/3/11, between 1/2/12 and 4/12/13 all estimates are 320 kWh. Latest invoice 4/12/13.
3111	Rugby Youth Headquarters	2	28	-92.91%	Latest reading and invoice 15/6/12 was a reading of 0 kWh.
5261	Warwick Fire Station	7	314	-97.77%	Disposed of 6/2/13. Last reading and invoice 6/2/13.
1013	Bedworth Youth Centre	0	37	-100.00%	Let to Positive About Young People. Last reading 2/4/12, last invoice 30/4/12. Reading of 11630 kWh on 18/10/11 (H).

Table 28 Properties with a 30% or more difference in electricity kWh/m² in 2013 compared to 2012

Electricity consumption per pupil (kWh / pupil)

The most frequently occurring electricity consumption per pupil fell between 250 kWh/pupil and 450 kWh/pupil.

The average across all educational properties was 398.5 kWh/pupil.

Electricity consumption per pupil educational properties ranged from 79 kWh/pupil up to 943 kWh/pupil.

The following properties have electricity consumption per pupil that is above or below 30% variance on the previous year and it is recommended that each school investigate to find out the reasons for this.

Electricity kWh p / pupil				
UPRN	Site Name	12-13 kWh / pupil	11-12 kWh / pupil	Increase / Decrease on 11-12
3085	Oakfield Primary School	750	293	155.80%
3008	Binley Woods Primary School	383	156	145.50%
3075	Rokeby Infant School	252	107	135.52%
5037	Clinton Primary School	420	235	78.91%
5340	Lillington Primary School	707	406	74.17%
3044	Long Lawford Primary School	297	189	57.32%
5291	Whitnash Primary School	462	295	56.75%
2225	Kingsbury Primary School	468	321	45.98%
2209	Birchwood Primary School	299	212	41.09%
3016	Clifton upon Dunsmore CE Primary School	377	275	36.94%
5228	Woodloes Community Primary School	414	304	36.19%
1108	St Paul's CE Primary School	254	190	33.89%
4268	St. Mary's Catholic Primary School	400	721	-44.53%
5036	Burton Green C E Primary School	371	710	-47.74%
4314	Wooton Wawen C.E. Primary School	517	1067	-51.54%

Table 29 Electricity consumption per pupil (kWh / pupil)

Gas consumption per unit of floor area (kWh / m²)

The most frequently occurring gas consumption fell between 88 kWh/m² and 169 kWh/m².

The average across all sites was 148 kWh/m².

Gas consumption per square metre of floor area in WCC properties ranged from 1 kWh/m² to 621 kWh/m².

The following properties (highlighted in the table) have high consumption and more than a 30% change in gas consumption kWh/m² since last year's CRC Report and would need further investigation to find out the reasons for this.

Gas kWh p / m ²				
UPRN	Site Name	12-13 kWh / m ²	11-12 kWh / m ²	Increase / Decrease on 11-12
5228	Woodloes Community Primary School	54	5	971.93%
3085	Oakfield Primary School	75	9	742.31%
5348	All Saints' C.E. Primary School	128	24	424.46%
1152	Glendale Infant School	111	32	251.64%
5229	Emscote Infant School	257	78	231.43%
1108	St Paul's CE Primary School	84	33	151.45%
5132	The Newbold Social Education Centre	276	167	65.00%
4228	Bridge Town Primary School	81	53	51.68%
4178	St Mary's Catholic Primary School	296	200	48.05%
1061	The Bridgeway Social Education Centre	317	215	47.61%
5097	The Round Oak School And Support Service	120	84	43.68%
1158	Etone Community School & Technology College	178	124	43.29%
4219	The Willows C.E. Primary School	129	91	41.22%
4009	St Benedict's Catholic High School	93	67	39.01%
3260	Sir Frank Whittle Business Centre	84	61	38.74%
2012	Outwoods Primary School	146	105	38.56%

Gas kWh p / m ²				
UPRN	Site Name	12-13 kWh / m ²	11-12 kWh / m ²	Increase / Decrease on 11-12
1112	Higham Lane School A Business & Enterprise College	128	94	36.26%
4193	Shipston Primary School	129	95	35.38%
4084	Harbury Library & Information Centre	164	122	34.76%
4191	Shipston High School	217	162	34.14%
1270	EPIC	88	66	33.80%
1140	St Thomas More Catholic School	97	73	33.06%
1127	Manor Park Community School	239	182	31.55%
4231	Shotton St Andrew's C.E. Primary School	195	149	30.56%
5098	St Anthony's Catholic Primary School	107	156	-31.40%
4067	Coughton C.E. Primary School	85	125	-31.73%
1186	Caldwell Grange Home For Elderly People	209	309	-32.42%
4200	Low Furlong Home For Elderly People	214	320	-33.20%
1157	Hatters Space Community Education Centre	155	236	-34.45%
1133	Our Lady Of The Angels Catholic Infant School	55	85	-35.55%
4247	Lower Meadow Home For Elderly People	270	425	-36.49%
2171	Polesworth Fire Station	380	602	-36.86%
3144	Rugby Fire Station	238	381	-37.58%
1144	Galley Common Infant School	67	114	-41.04%
2001	Nursery Hill Primary School	89	153	-41.90%
5231	Warwick Nursery School	82	149	-44.82%
5195	Field Archaeology Office & Museum Stores	131	237	-44.82%
1137	Alderman Smith School	131	244	-46.24%
5190	Judge's House	226	437	-48.29%

Gas kWh p / m ²				
UPRN	Site Name	12-13 kWh / m ²	11-12 kWh / m ²	Increase / Decrease on 11-12
3108	St Andrew's Benn CE (Voluntary Aided) Primary School	64	137	-53.41%
3016	Clifton upon Dunsmore CE Primary School	129	284	-54.53%
5197	Barrack Street Block	144	326	-55.80%
1080	Warwickshire Pupil Reintegration Unit, The Keresley Centre	56	213	-73.75%
5287	Warwick Registration Service	120	572	-79.04%
2061	Woodlands School	31	155	-80.01%
4249	Drayton Avenue Centre	56	426	-86.86%
4016	Alcester Fire Station	60	486	-87.66%
3075	Rokeby Infant School	1	17	-94.09%
5245	The Old Clink	6	134	-95.51%

Table 30 Gas consumption per unit of floor area (kWh / m²)

Gas consumption per pupil (kWh / pupil)

The most frequently occurring gas consumption per pupil fell between 500kWh/pupil and 1370 kWh/pupil.

Gas consumption per pupil in WCC school properties ranged from 11 kWh/m² to 3,196 kWh/m².

The average across all educational properties was 988 kWh/pupil

The following properties have gas consumption per pupil with a variance of over or less than 30% on the previous year's figures and it is recommended that each school investigate to find out the reasons for this.

Gas kWh p / pupil				
UPRN	Site Name	12-13 kWh / pupil	11-12 kWh / pupil	Increase / Decrease on 11-12
5228	Woodloes Community Primary School	477	44	979.76%
3085	Oakfield Primary School	565	67	737.57%
5348	All Saints' C.E. Primary School	756	144	425.48%
1108	St Paul's CE Primary School	398	159	150.63%
4228	Bridge Town Primary School	640	424	51.12%
4178	St Mary's Catholic Primary School	3196	2159	48.00%
4219	The Willows C.E. Primary School	843	598	41.03%
2012	Outwoods Primary School	717	516	38.87%
5098	St Anthony's Catholic Primary School	676	985	-31.40%
4067	Coughton C.E. Primary School	491	720	-31.78%
2001	Nursery Hill Primary School	751	1299	-42.18%
3108	St Andrew's Benn CE (Voluntary Aided) Primary School	448	966	-53.62%
3016	Clifton upon Dunsmore CE Primary School	623	1367	-54.44%
3075	Rokeby Infant School	11	169	-93.50%

Table 31 Gas consumption per pupil (kWh / pupil)

WCC Electricity Benchmarks 11/12 (average kWh/m² of all properties in the sample)

Property Type	11/12 kWh/m ²	12/13 kWh/m ²	Range kWh/m ² (highest to lowest)	Number of properties in 12/13 sample	Highest Consumption of Electricity
Waste Facility / recycling Centre	84	689	1567-81	4	Kenilworth / Cherry Orchard
Office	84	77	173-18	21	Warwick County Records Office
Fire Station	66	83	275-8	18	Southam Fire Station
Business Centre Communal Area	59	60	118-26	4	Eliot Park Innovation Centre
Complex Needs Centre	-	39	49-22	3	Brookbank
Country Park / Outdoor Education Centre	93	80	134-48	5	Pooley Fields Heritage Centre
Depot	72	95	212-20	6	Wellesbourne Divisional Highways Depot
Infant School	-	51	79-31	26	Leamington Hastings CE Infant
Library / Information Centre	74	71	154-14	15	Wolston
Museum	155	61	68-54	2	St. John's Museum
Nursery / Children's Centre / Early Year's Centre / Family Centre	70	67	239-19	16	Nuneaton, Ramsden Avenue Family Community care Centre
Primary / Junior School	-	50	177-17	168	Norton Lindsey / Wolverton Primary School
Secondary / High School / College	-	53	86-21	45	Nuneaton / Oak Wood Secondary School
Youth and Community Centre	68	44	97-19	6	Ratcliffe Youth & Community Centre
Academy		52	74-36	26	
College		52	77-23	22	
Children's Centre	70	46	87-19	10	
Social Education Centres	45	-			

Property Type	11/12 kWh/m ²	12/13 kWh/m ²	Range kWh/m ² (highest to lowest)	Number of properties in 12/13 sample	Highest Consumption of Electricity
Day Centres	111	-			
Homes for Elderly People	52	66	102-26	9	Disposed of. Lower Meadow.

Table 32 Electricity - average range

WCC Gas Benchmarks 11/12

Property Type	11/12 kWh/m ²	12/13 kWh/m ²	Range kWh/m ² (highest to lowest)	Number of properties in 12/13 sample	Highest Consumption of Gas
Fire Stations	237	255	627-66	14	Kenilworth
Primary / Junior School	-	131	345-28	145	Alcester St Nicholas CE Primary
Museum	147	217	288-145	2	Warwick County Museum
Secondary / High School / College	-	149	328-44	24	Kenilworth School and Sports College (Upper School)
Offices	107	-			
Library & Information Centres	150	140	257-39	13	Harbury. Disposed of.
Early Years and Nursery Centres	120	-			
Youth and Community Centres	101	187	377-110	7	Atherstone, the Ratcliffe Youth & Community Centre
Homes for Elderly People	285	-			
Social Education Centres	191	-			

Table 33 Gas - average and range

All Properties Ranked by kWh/m2

	UPRN	Site	kWh/m2	Notes
1.	5043	KENILWORTH/Cherry Orchard Household Waste Recycling Centre, Pipers Lane	1567	
2.	2122	GRENDON/Household Waste Recycling Centre, Spon Lane	931	
3.	1299	BEDWORTH/Former Church Way Satellite CSS, 9 & 11 Church Way	286	
4.	4185	SOUTHAM/Fire Station, Coventry Street	275	
5.	1262	NUNEATON/Family Community Care Centre, Ramsden Avenue	239	
6.	4275	STUDLEY/Fire Station, Bell Lane	222	
7.	4308	WELLESBOURNE/Divisional Highways Depot, Loxley Road	212	
8.	4099	HENLEY-IN-ARDEN/Highways Sub-Depot, Buckley Green Lane	199	
9.	4235	STRATFORD-UPON-AVON/Burton Farm Household Waste Recycling Centre, Burt	179	
10.	4316	NORTON LINDSEY/Wolverton Primary School (Foundation), Wolverton Fields	177	
11.	5252	WARWICK/County Record Office, Priory Park	173	
12.	3225	WOLSTON/Library & Information Centre, Warwick Road	154	
13.	5196	WARWICK/Northgate House Conference Centre, Northgate	154	
14.	2168	POLESWORTH/Library & Information Centre, Bridge Street	142	
15.	5187	WARWICK/Shire Hall and Courts, Market Square	134	
16.	2214	POLESWORTH/Pooley Fields Heritage Centre, Pooley Lane	134	
17.	5384	WARWICK/Saltisford Office Park, Ansell Way	127	
18.	5189	WARWICK/Shire Hall Complex (1 Northgate Street), 1 Northgate Street	125	
19.	5124	LEAMINGTON SPA/Fire & Rescue Service Headquarters, Warwick Street	122	
20.	4074	FENNY COMPTON/Fire Station, Memorial Road	121	
21.	5293	WHITNASH/Library & Information Centre, Franklin Road	119	
22.	1270	NUNEATON/Eliot Park Innovation Centre, Eliot Park	118	
23.	4105	ILMINGTON/C.E. Primary School, Back Street	116	
24.	5010	WARWICK/Trading Standards Headquarters, Old Budbrooke Road	116	

	UPRN	Site	kWh/m2	Notes
25.	3085	RUGBY/Oakfield Primary (Academy) School, Oakfield Road	108	
26.	1242	BEDWORTH/Kings House, King Street	103	
27.	4247	STRATFORD-UPON-AVON/Lower Meadow Home For Elderly People, Drayton Avenue	102	
28.	3016	CLIFTON UPON DUNSMORE/C. of E. Primary School, Station Road	99	
29.	2017	ATHERSTONE/The Ratcliffe Youth & Community Centre, Ratcliffe Road	97	
30.	1114	NUNEATON/Camp Hill Early Years Centre, Hollystitches Road	97	
31.	1086	NUNEATON/Warwick House, Bond Gate	97	
32.	1144	NUNEATON/Galley Common Infant School, Plough Hill Road	96	
33.	4131	LOXLEY/C.E. Primary School, Loxley	94	
34.	4314	WOOTTON WAWEN/C.E. Primary School, Alcester Road	93	
35.	5058	KENILWORTH/Fire Station, School Lane	93	
36.	4028	TEMPLE HERDEWYKE/Primary School, Falkland Place	92	
37.	3205	BUBBENHALL/Ryton Pools Country Park, Ryton Road	91	
38.	4135	MORETON MORRELL/C.E. Primary School (Foundation)	87	
39.	2096	COLESHILL/Orchard Blythe Home For Elderly People, Wingfield Road	87	
40.	1021	BEDWORTH/Heath Nursery & Children's Centre (Maint), Glebe Avenue	87	
41.	2016	ATHERSTONE/Early Years Centre (Maintained), Kings Avenue	86	
42.	1276	NUNEATON/Oak Wood Secondary School, Morris Drive	86	
43.	1141	NUNEATON/Abbey CE Infant School, Aston Road	84	
44.	2184	ATHERSTONE/Warwick House, Ratcliffe Street	84	
45.	1037	BEDWORTH/Warwickshire Fire & Rescue Training & Dev. Centre, Training &	82	
46.	5111	LEAMINGTON SPA/Leamington Household Waste Recycling Centre, Princes Dr	81	
47.	2224	COLESHILL/Library & Information Centre, 19a Parkfield Road	80	
48.	4069	ETTINGTON/C.E. Primary School, Churchill Close	79	
49.	3042	LEAMINGTON HASTINGS/CE Infant School, Birdingbury Road	79	

	UPRN	Site	kWh/m2	Notes
50.	4200	SHIPSTON-ON-STOUR/Low Furlong Home For Elderly People, Darlingscote Road	78	
51.	2200	ATHERSTONE/The Cottage, Arden Hill, Emergency Duty Team	77	
52.	2001	ANSLEY/Nursery Hill Primary School, Ansley Common	77	
53.	3086	RUGBY/St Marie's Primary School (former Junior), Merttens Drive	77	
54.	2160	DORDON/The Polesworth School - A Specialist Language, College (Academy	77	
55.	2129	HARTSHILL/Hayes Country Park, Oldbury Road	76	
56.	2136	KINGSBURY/School, a Specialist Science & Maths Col, Tamworth Road	76	
57.	1186	NUNEATON/Caldwell Grange Home For Elderly People, Donnithorne Avenue	75	
58.	4294	TYSOE/C.E. Primary School, Saddledon Street	75	
59.	4204	SHIPSTON-ON-STOUR/Highways Sub-Depot, Brailes Road	75	
60.	3051	NEWBOLD-ON-AVON/The Avon Valley School & Performing Arts College,	75	
61.	5012	WARWICK/Budbrooke County Highways Head Office, Old Budbrooke Road	74	
62.	1137	NUNEATON/Academy (Alderman Smith), Radnor Drive	74	
63.	1009	BEDWORTH/St Michael's C.E. Primary School, Hazel Grove	74	
64.	1076	BULKINGTON/Arden Forest Infant School, Weston Lane	73	
65.	1033	BEDWORTH/Library & Information Centre, 18 High Street	73	
66.	4093	HENLEY-IN-ARDEN/St Mary's Catholic Primary School, Arden Road	73	
67.	4174	SOUTHAM/St James (Voluntary Aided) CE Primary School, Toll Gate Road	73	
68.	3012	BRINKLOW/The Revel C.E. (Aided) Primary School Annexe, The Crescent	73	
69.	4079	GREAT ALNE/Primary School, School Road	72	
70.	4057	BRAILES/C.E. Primary School, Lower Brailes	72	
71.	4025	WILMCOTE/C.E. (Voluntary Aided) Primary School, Church Road	72	
72.	3033	DUNCHURCH/Infant School (Foundation), School Street	71	
73.	5085	LEAMINGTON SPA/Telford Infant School, Kelvin Road	71	

	UPRN	Site	kWh/m2	Notes
74.	5377	WARWICK/Orion House, Athena Drive	70	
75.	1280	EXHALL/The Hub, Bayton Road Industrial Estate	70	
76.	3009	BINLEY WOODS/Former Library & Information Centre, Monks Road	69	
77.	4125	LONG COMPTON/Acorns Primary School, Long Compton	69	
78.	4276	STUDLEY/Four Acres Home For Elderly People, Archer Close	69	
79.	4234	STRATFORD-UPON-AVON/Library & Information Centre, Henley Street	69	
80.	4367	WELLESBOURNE/Fire Station, Loxley Road	68	
81.	5247	WARWICK/St John's House Museum, Coten End	68	
82.	5037	KENILWORTH/Clinton Primary School, Caesar Road	68	
83.	4084	HARBURY/Former Library & Information Centre, High Street	68	
84.	3091	RUGBY/Hillmorton Primary School, Watts Lane	68	
85.	4216	STRATFORD-UPON-AVON/High School, A Maths &, Computing Specialist College	67	
86.	5231	WARWICK/Children's Centre & Nursery School (Maint), Coventry Road	66	
87.	4268	STUDLEY/St. Mary's Catholic Primary School, Pool Road	66	
88.	5233	WARWICK/Myton School A Specialist Science College &, Training School (65	
89.	3276	RUGBY/Cawston Grange Primary School, Scholars Drive	65	
90.	5074	LEAMINGTON SPA/North Leamington School, Sandy Way	65	
91.	2050	AUSTREY/CE Primary School, St Nicholas Close	64	
92.	2140	HURLEY/Primary School, Heanley Lane	64	
93.	4245	STRATFORD-UPON-AVON/Fire Station, Masons Road	64	
94.	2036	ATHERSTONE/Fire Station, Kings Avenue	64	
95.	5041	KENILWORTH/St Augustine's Catholic Primary School, Hollis Lane	63	
96.	5092	LEAMINGTON SPA/Whitnash Nursery School (Maintained), Nursery Lane	63	
97.	4073	FENNY COMPTON/The Dasset C.E. Primary School, Memorial Road	62	
98.	4007	ALCESTER/Our Lady's Catholic Primary School, St Faith's Road	62	
99.	2047	ATHERSTONE/Bracebridge Court Home For Elderly People, Friary Road	62	

	UPRN	Site	kWh/m2	Notes
100.	5027	KENILWORTH/Priors Field Primary School, Clinton Lane	62	
101.	5106	LEAMINGTON SPA/Leamington STEPS - 43 Rugby Road, 43 Rugby Road	62	
102.	4173	SOUTHAM/College, Welsh Road West	61	
103.	2059	COLESHILL/The Coleshill School - a Maths & Computing College, (Academy	61	
104.	1050	BEDWORTH/Fire Station, Park Road	60	
105.	2104	CURDWORTH/Primary School, Farthing Lane	60	
106.	3223	WOLSTON/St Margaret's CE Primary School, Main Street	60	
107.	1014	BEDWORTH/Exhall Grange School & Science College, Easter Way	60	
108.	5405	WARWICK/Ridgeway School, Deansway	60	
109.	2177	SHUSTOKE/CE Primary School, Forge Road	59	
110.	3095	RUGBY/Bilton Infant School, Magnet Lane	59	
111.	1134	NUNEATON/St Joseph's Catholic Junior School, Riversley Park,	59	
112.	3047	MONKS KIRBY/The Revel C.E. (Aided) Primary School, Brockhurst Lane	59	
113.	5033	KENILWORTH/Thorns Community Infant School, Blackthorn Road	59	
114.	2171	POLESWORTH/Fire Station, Tamworth Road	58	
115.	1119	NUNEATON/Middlemarch School (Foundation), College Street	58	
116.	4206	STOCKTON/Primary School, School Lane	58	
117.	4219	STRATFORD-UPON-AVON/The Willows C. of E. Primary School, The Willows N	58	
118.	3204	RYTON ON DUNSMORE/Provost Williams C.E. Primary School, Sodens Avenue	58	
119.	4168	SNITTERFIELD/Primary School, School Road	57	
120.	2011	ATHERSTONE/Queen Elizabeth School & Sports College, Lower School, Long St	57	
121.	5021	HATTON/The Ferncumbe CE Primary School, The Green	57	
122.	5009	BUDBROOKE/Primary School, Styles Close	57	
123.	4223	STRATFORD-UPON-AVON/Bishopton Primary School, Drayton Avenue	57	
124.	3092	RUGBY/English Martyrs Catholic Primary School, High Street	57	
125.	1110	NUNEATON/The George Eliot School (Academy), Raveloe Drive	56	
126.	5236	WARWICK/Round Oak School, Support Service & Sports College,	56	

	UPRN	Site	kWh/m2	Notes
127.	2044	ATHERSTONE/Arden Hill Family Centre, North Warks Children & Family	56	
128.	4231	STRATFORD-UPON-AVON/Shottery St Andrew's C.E. Primary School, Hathaway	56	
129.	4005	ALCESTER/Grammar School (Academy), Birmingham Road	56	
130.	4064	CLAVERDON/Primary School, Breach Lane	56	
131.	1121	NUNEATON/Stockingford Primary School (former Junior), Grove Road	56	
132.	5036	BURTON GREEN/CE Primary School, Hob Lane	56	
133.	5182	WARWICK/Myton Sports Ground and Pavillion, Myton Road	56	
134.	1157	NUNEATON/Hatters Space Community Centre, Hatters Space	55	
135.	1108	NUNEATON/St Paul's CE Primary School, Wiclif Way	55	
136.	3074	RUGBY/Harris School, Harris Drive, Overslade Lane	55	
137.	5088	LEAMINGTON SPA/St Patrick's Catholic Primary School, Cashmore Avenue	55	
138.	1122	NUNEATON/Stockingford Early Years Centre & Library (Maintd), St Paul's	55	
139.	4298	WELFORD-ON-AVON/Primary School	55	
140.	4302	WELLESBOURNE/C.E. Primary School, Mountford Close	55	
141.	4077	LEAMINGTON SPA/Lighthorne Heath Primary School, Stratford Road	55	
142.	3243	RUGBY/Oakfield Park, 32 Bilton Road	55	
143.	5248	WARWICK/County Museum (Market Hall), Market Place	54	
144.	3032	DUNCHURCH/Boughton C. of E. (V.A.) Junior School, Dew Close	54	
145.	1063	BEDWORTH/Beads House, Newtown Road	54	
146.	4305	WELLESBOURNE/Library & Information Centre, Kineton Road	54	
147.	1133	NUNEATON/Our Lady Of The Angels Catholic Infant School, Riversley Park	54	
148.	5295	WHITNASH/The Lawns Home For Elderly People, 1 Gleave Road	54	
149.	3144	RUGBY/Fire Station, Corporation Street	54	
150.	2157	NEWTON REGIS/CE Primary School, Austrey Lane	53	
151.	5110	LEAMINGTON SPA/Lillington Library & Information Centre, Valley Road	53	

	UPRN	Site	kWh/m2	Notes
152.	4221	STRATFORD-UPON-AVON/Stratford Grammar School for Girls A Specialist, C	53	
153.	4199	SHIPSTON-ON-STOUR/Fire Station, Telegraph Street	53	
154.	2060	COLESHILL/St Edwards Catholic Primary School, Packington Lane	53	
155.	2027	ATHERSTONE/Library & Information Centre, Long Street	53	
156.	2232	KINGSBURY/Water Park Outdoor Education Centre, Bodymoor Heath Lane	53	
157.	5029	KENILWORTH/School and Sports College (Trust), Lower School (Abbey)	53	
158.	4225	STRATFORD-UPON-AVON/Thomas Jolyffe Primary School, Clopton Rd	53	
159.	4006	ALCESTER/High School Technology College (Academy), Gerard Road	53	
160.	4083	HARBURY/CE Primary School, Mill Street	52	
161.	4090	HENLEY-IN-ARDEN/River House School, Stratford Road	52	
162.	1081	KERESLEY/Newland Primary School, Grove Lane	52	
163.	2124	HARTSHILL/School (Academy), Church Road	52	
164.	2064	COLESHILL/C. of E. Primary School, Wingfield Road	52	
165.	4016	ALCESTER/Fire Station, Seggs Lane	52	
166.	2109	DORDON/The Shortwoods former CSS Centre,	52	
167.	4271	MAPPLEBOROUGH GREEN/C. E. Primary School, Henley Road	52	
168.	3099	RUGBY/Abbots Farm Infant School, Abbots Way	52	
169.	2125	HARTSHILL/Michael Drayton Junior School, The Woodlands	52	
170.	4055	BIDFORD ON AVON/Fire Station, Bramley Way	51	
171.	4009	ALCESTER/St Benedict's Catholic High School, A Maths &, Computing College	51	
172.	1188	NUNEATON/The Hilary Road Centre, District Children Services	51	
173.	3008	BINLEY WOODS/Primary School, Coombe Drive	51	
174.	4376	BIDFORD ON AVON/CE Primary School / Community Library, Bramley Way	51	
175.	2225	KINGSBURY/Primary School, Bromage Avenue	51	
176.	4279	TANWORTH-IN-ARDEN/C.E. Primary (Academy) School, The Green	51	
177.	4089	HENLEY-IN-ARDEN/High School (Academy), Stratford Road	51	

	UPRN	Site	kWh/m2	Notes
178.	5079	LEAMINGTON SPA/Campion School (Academy), Sydenham Drive	50	
179.	1019	BEDWORTH/Race Leys Junior (Academy) School, Barton Road	50	
180.	3210	STRETTON-ON-DUNSMORE/Knightlow C.E. Primary School, Hill Crescent	50	
181.	4193	SHIPSTON-ON-STOUR/Shipston Primary School (Foundation), Station Road	50	
182.	5087	LEAMINGTON SPA/Kingsway Community Primary School, Baker Avenue	50	
183.	5234	WARWICK/Aylesford School. A Specialist Language & Music Co, Academy	50	
184.	1012	BEDWORTH/St Francis Catholic Primary School, Rye Piece Ringway	50	
185.	5100	LEAMINGTON SPA/Brookhurst Primary School, Ullswater Avenue	50	
186.	4263	STUDLEY/Community Infant School, High Street	49	
187.	5226	WARWICK/Newburgh Primary School, Kipling Avenue	49	
188.	1158	NUNEATON/Etone Technology Language Voc. College Academy, Leicester Road	49	
189.	4266	STUDLEY/High School, Humanities & Music College, (Academy)	49	
190.	5169	RADFORD SEMELE/CE Primary School, School Lane	49	
191.	4382	STRATFORD-UPON-AVON/Brookbank Complex Needs Centre, Alcester Road	49	
192.	6002	LLANDUDNO JUNCTION/Marle Hall Outdoor Education Centre, Marl Lane	48	
193.	3071	RUGBY/Boughton Leigh Infant School, Hollowell Way	48	
194.	2115	FILLONGLEY/Bournebrook C.E. Primary School, Coventry Road	48	
195.	2021	ATHERSTONE/St Benedict's Catholic Primary School, Church Walk	48	
196.	4229	STRATFORD-UPON-AVON/Primary School, Broad Street	48	
197.	5006	BISHOPS TACHBROOK/Bishop's Tachbrook CE Primary School, Kingsley Road	48	
198.	1116	NUNEATON/St Anne's Catholic Primary School, Camp Hill Drive	48	
199.	4227	STRATFORD-UPON-AVON/King Edward VI School (Academy), Church Street	48	
200.	1018	BEDWORTH/Race Leys Infant School, Hurst	47	

	UPRN	Site	kWh/m2	Notes
		Road		
201.	5389	LEAMINGTON SPA/Lillington Community and Children's Centre, 3, Mason Av	47	
202.	1198	NUNEATON/Ramsden Complex Needs Centre, School Walk, off Highfield Rd	47	
203.	4159	DUNNINGTON/C. of E. (V.A.) Primary School, Dunnington	47	
204.	4158	SALFORD PRIORS/C.E. Primary School, School Road	47	
205.	4129	LONG ITCHINGTON/C.E. Primary School, Stockton Road	47	
206.	1029	EXHALL/St Giles Junior School, Hayes Lane	47	
207.	5190	WARWICK/Judge's House, Northgate Street	47	
208.	5228	WARWICK/Woodloes Community Primary School, Deansway	47	
209.	1017	EXHALL/Ash Green School & Arts College (Academy), Ash Green Lane,	47	
210.	3057	PRINCETHORPE/Our Lady's Catholic Primary School, Leamington Road	47	
211.	4008	ALCESTER/St. Nicholas C.E. (controlled) Primary School, St Faith's Road	47	
212.	3073	RUGBY/Brooke School, Overslade Lane	47	
213.	5026	KENILWORTH/School and Sports College (Trust), Castle Hall (Sixth Form)	46	
214.	3148	RUGBY/Fawsley House, 25 Hillmorton Road	46	
215.	1142	NUNEATON/All Saints CE Primary School, Coventry Road	46	
216.	5348	LEEK WOOTTON/All Saints E. Community Primary School, Warwick Road	46	
217.	5086	LEAMINGTON SPA/Telford Junior School, Telford Avenue	46	
218.	2166	WARTON/Nethersole C.E. Primary School, Maypole Road	46	
219.	3076	RUGBY/Rokeby Primary School, Anderson Ave	46	
220.	3082	RUGBY/High School (Academy), Longrood Road	46	
221.	4110	KINETON/C. of E. (Voluntary Aided) Primary School, King John's Road	46	
222.	5104	LEAMINGTON SPA/St Peter's Catholic Primary School, Augusta Place	45	
223.	3090	RUGBY/Bilton School A Maths & Computing College Academy, Lawford Lane	45	
224.	2005	ARLEY/Gun Hill Infant School, Gun Hill	45	
225.	1061	BEDWORTH/The Bridgeway former CSS Centre, Coalpit Fields Road	45	

	UPRN	Site	kWh/m2	Notes
226.	3104	RUGBY/Bawnmore Infant School, Bawnmore Road	45	
227.	5003	BARFORD/St Peters CE Primary School, Church Street	45	
228.	4180	SOUTHAM/Library & Information Centre, High Street	45	
229.	4108	KINETON/High School A Specialist Sports College, Banbury Rd	45	
230.	1124	NUNEATON/St Nicolas CE (Voluntary Aided) Primary School, Windermere Av	45	
231.	5066	LAPWORTH/CE Primary School, Station Lane	45	
232.	5094	LEAMINGTON SPA/Trinity Catholic School, A Specialist Arts and, Technology College	44	
233.	5230	WARWICK/All Saints C. of E. Junior School, Nelson Avenue	44	
234.	4067	COUGHTON/C.E. Primary School, Coughton Lane	44	
235.	1140	NUNEATON/St Thomas More Catholic School & Technology, College	44	
236.	3089	RUGBY/Ashlawn School (Academy), Ashlawn Road	44	
237.	5340	LEAMINGTON SPA/Lillington Nursery & Primary School, Cubbington Road	44	
238.	4255	STRATFORD-UPON-AVON/The Saltway Centre & Stratford Family Centre, Alcester	44	
239.	1112	NUNEATON/Higham Lane School A Business & Enterprise College, Academy	44	
240.	5239	WARWICK/Westgate Primary School, Bowling Green Street	43	
241.	4285	TREDINGTON/Newbold & Tredington C.E. Primary School, Manor Farm Road	43	
242.	3229	WOLVEY/CE Primary School, Bulkington Road	43	
243.	5264	WARWICK/The Emscote Centre, Nelson Lane	43	
244.	1143	NUNEATON/Queens CE Junior School, Bentley Road	42	
245.	4092	HENLEY-IN-ARDEN/C of E (VA) Primary School, Arden Road	42	
246.	5265	WARWICK/Park View Home For Elderly People, Priory Road	42	
247.	5268	WARWICK/Myton Park Centre, Myton Lane	42	
248.	2106	DORDON/Community Primary School (Academy), Roman Way	42	
249.	5028	KENILWORTH/School and Sports College (Trust), Upper School (Priory)	42	

	UPRN	Site	kWh/m2	Notes
250.	5030	KENILWORTH/Park Hill Junior School, Parkfield Drive	42	
251.	1125	NUNEATON/Whitestone Infant School, Magyar Crescent	42	
252.	4267	STUDLEY/St. Mary's CE (VA) Junior School, New Road	42	
253.	2208	WATER ORTON/Primary School, Attleborough Lane	42	
254.	4191	SHIPSTON-ON-STOUR/Shipston High School, (Academy),	41	
255.	1075	BULKINGTON/St James CE Junior School, Barbridge Road	41	
256.	1015	EXHALL/Cedars Infant School, Trenance Road	41	
257.	2080	COLESHILL/Fire Station, Park Road	41	
258.	1147	NUNEATON/Freeway Centre - WEST Local Provider Services, Park Avenue	41	
259.	3233	RUGBY/Brownsover Community School, Webb Drive	41	
260.	3109	RUGBY/The Benn Education Centre, Claremont Road	41	
261.	2061	COLESHILL/Woodlands School (Formerly Blythe), Packington Lane	41	
262.	5229	WARWICK/Emscote Infant School, All Saints Road	40	
263.	1010	BEDWORTH/Children's Centre, St Michaels School	40	
264.	5132	LEAMINGTON SPA/The Newbold Community Support Service Centre, Leicester	40	
265.	5015	CUBBINGTON/CE Primary School, Church Hill	40	
266.	2139	KINGSBURY/Wood End Primary School, Wood Street	40	
267.	1007	BEDWORTH/Nicholas Chamberlaine Technology College, Bulkington Road	40	
268.	2013	ATHERSTONE/Outwoods Primary School, (Former Arden Hill Infant)	40	
269.	1023	BEDWORTH/Canon Maggs CE Junior School, Derwent Road	40	
270.	5090	LEAMINGTON SPA/St Paul's CE Primary School, Upper Holly Walk	40	
271.	4176	SOUTHAM/Primary School, St James' Road	40	
272.	5241	WARWICK/St Mary Immaculate Catholic Primary School, Wathen Road	40	
273.	4086	HASELOR/School (Foundation), Haselor	40	

	UPRN	Site	kWh/m2	Notes
274.	3079	RUGBY/Henry Hinde Infant (Academy) School, Grenville Close	40	
275.	5290	WHITNASH/Briar Hill Infant School, Coppice Road	39	
276.	3083	RUGBY/Bilton CE Junior School, Plantagenet Drive	39	
277.	2209	DORDON/Birchwood Primary (Academy) School, Birchwood Avenue	39	
278.	1247	BEDWORTH/Goodyers End Primary School, Bowling Green Lane	39	
279.	5089	LEAMINGTON SPA/Sydenham Primary School, Calder Walk	39	
280.	3068	RUGBY/Eastlands Primary School, Lansdowne Place	39	
281.	3037	DUNCHURCH/Highways Sub-Depot, Southam Road	38	
282.	4100	HAMPTON LUCY/C.E. Primary School, Church Street	38	
283.	4366	NAPTON-ON-THE-HILL/St. Lawrence C.E. (Voluntary Aided) Primary School,	38	
284.	5339	WARWICK/Coten End Primary School, Coten End	38	
285.	2053	BADDESLEY ENSOR/Woodside C.E. Primary School, Maypole Lane	38	
286.	1153	NUNEATON/Chilvers Coton Community Infant School, Fitton Street	38	
287.	4228	STRATFORD-UPON-AVON/Bridge Town Primary School, Byron Road	38	
288.	1145	NUNEATON/Park Lane Primary School, Park Lane	38	
289.	4284	TEMPLE GRAFTON/C.E. Primary School, Church Bank	38	
290.	4144	QUINTON/Primary School	38	
291.	4226	STRATFORD-UPON-AVON/Welcombe Hills School, Blue Cap Road	38	
292.	5289	WHITNASH/St Margaret's CE Junior School, Coppice Road	38	
293.	5242	WARWICK/Youth Centre, 71, Coten End	38	
294.	1152	NUNEATON/Glendale Infant School, Skye Close	37	
295.	3114	RUGBY/Henry Hinde Junior School, Cornwallis Road	37	
296.	1249	BEDWORTH/Newdigate Primary School, Anderton Road	37	
297.	1250	NUNEATON/Weddington Primary School, Winchester Avenue	37	

	UPRN	Site	kWh/m2	Notes
298.	5098	LEAMINGTON SPA/St Anthony's Catholic Primary School, Sydenham Drive	37	
299.	1107	NUNEATON/Croft Junior School, Northumberland Avenue	37	
300.	5032	KENILWORTH/St Nicholas CE Primary School, The Blundells	36	
301.	3146	RUGBY/Care & Choice Site - Former Abbotsbury HEP, Pettiver Crescent	36	
302.	3052	NEWBOLD-ON-AVON/Newbold Riverside (Academy) Primary School, Newbold Ro	36	
303.	5199	WARWICK/Premises At Montague Road, Montague Road	36	
304.	3107	RUGBY/St Marie's Catholic Primary School (former Infant), Dunchurch Road	36	
305.	4224	STRATFORD-UPON-AVON/Alveston E. Primary School, Knights Lane	35	
306.	3070	RUGBY/Boughton Leigh Junior School, Hollowell Way	35	
307.	2128	HARTSHILL/Nathaniel Newton Infant School, Victoria Road	35	
308.	1287	NUNEATON/Camp Hill Education Sports & Social (CHESS), 460 Cedar Road	35	
309.	1146	NUNEATON/Chetwynd Junior School, Caroline Close	34	
310.	1016	BEDWORTH/Wheelwright Lane Primary School, Wheelwright Lane	34	
311.	5101	LEAMINGTON SPA/Clapham Terrace Community Primary School, Clapham Terra	34	
312.	5034	KENILWORTH/Children's Centre & Nursery School (Main, Bertie Road	34	
313.	5073	LEAMINGTON SPA/Milverton Primary School, Greatehead Road	34	
314.	4035	BISHOPS ITCHINGTON/Primary School, Ladbroke Road	34	
315.	5193	WARWICK/4-22 Northgate Street, Former County Education Depart	34	
316.	4286	NEWBOLD-ON-STOUR/Newbold & Tredington C.E. Primary School,	34	
317.	3094	RUGBY/St. Oswald's C.E. Primary School, Addison Road	34	
318.	3044	LONG LAWFORD/Primary School, Holbrook Road	34	
319.	4230	STRATFORD-UPON-AVON/St Gregory's Catholic Primary School, Avenue Road	34	

	UPRN	Site	kWh/m2	Notes
320.	3108	RUGBY/St Andrew's Benn CE (Voluntary Aided) Primary School, Chester Street	34	
321.	4303	WELLESBOURNE/C.E. Primary School Annexe, Mountford Close	33	
322.	2164	POLESWORTH/The Nethersole School CE Primary, High Street	33	
323.	5016	CUBBINGTON/Our Lady & St Teresa's Catholic Primary School, Windmill Hi	33	
324.	3152	RUGBY/The Bridge, 55 Clifton Road, Children & Family Service	33	
325.	5292	WHITNASH/St Joseph's Catholic Primary School, Rowley Road	32	
326.	5291	WHITNASH/Primary School, Langley Road	32	
327.	5136	LEAMINGTON SPA/Holly Walk House, 56/58 Holly Walk	32	
328.	1131	NUNEATON/Wembrook Primary School, Avenue Road	32	
329.	2065	COLESHILL/High Meadow Infant School, Norton Road	31	
330.	5097	LEAMINGTON SPA/The Pound Lane Teaching & Learning Centre, Pound Lane	31	
331.	1028	BEDWORTH/All Saints C. of E. Infant School & Nursery Unit, The Priors	31	
332.	1022	BEDWORTH/Canon Evans CE Infant School, Derwent Road	31	
333.	1248	NUNEATON/Milby Primary School, Milby Drive	31	
334.	5105	LEAMINGTON SPA/Lillington Youth Club, Mason Avenue	31	
335.	5254	WARWICK/Priory Bungalow, Priory Park	31	
336.	2006	ARLEY/Herbert Fowler Junior School, Ansley Lane	31	
337.	2048	ATHERSTONE/The Atherstone Centre, North Street	30	
338.	5096	LEAMINGTON SPA/Shrubland Street Community Primary School, Shrubland St	30	
339.	5039	KENILWORTH/St John's Primary School, Nursery & Children's Centre, Mortime	30	
340.	4383	SHIPSTON-ON-STOUR/Stour Bank Former CSS, Haymeadow	30	
341.	2012	ATHERSTONE/Outwoods Primary School, (Former Oakfield Junior Sch.)	30	
342.	3078	RUGBY/St Matthew's Bloxam C.E. Primary School, Webb Ellis Road	30	

	UPRN	Site	kWh/m2	Notes
343.	4178	SOUTHAM/St Mary's Catholic Primary School, Daventry Road	29	
344.	3260	RUGBY/Sir Frank Whittle Business Centre, Great Central Way	28	
345.	4264	STUDLEY/Youth and Community Centre, High Street	27	
346.	5253	WARWICK/Priory House, Priory Park	27	
347.	3105	RUGBY/Northlands Primary School, Pinders Lane	27	
348.	3150	RUGBY/Bloxham Centre, Somers Road	27	
349.	1097	NUNEATON/Centenary Business Centre, Hammond Close	26	
350.	1062	BEDWORTH/Site for Care & Choice - Former Mayfield HEP, Mayfield Close	26	
351.	1259	NUNEATON/Transport Depot, Units D2, D3 & D4 Greenwood Court, Veasey Cl	24	
352.	2231	POLESWORTH/The Branch Former CSS Centre, Dovecote Close	24	
353.	2010	ATHERSTONE/Queen Elizabeth School & Sports College, Upper School, Witherley	23	
354.	3100	RUGBY/Abbots Farm Junior School, Abbots Way	23	
355.	3262	RUGBY/Paddox Primary School, Fareham Ave	22	
356.	5103	LEAMINGTON SPA/The Fordsfield Complex Needs Centre, Bury Road	22	
357.	2014	ATHERSTONE/Racemeadow Primary School, Ratcliffe Road	22	
358.	4194	SHIPSTON-ON-STOUR/Library & Information Centre, 12, Church Street	21	
359.	3112	RUGBY/Lawrence Sheriff School, Clifton Road	21	
360.	1080	KERESLEY/The Keresley Teaching & Learning Centre, Bennetts Road North	21	
361.	1127	NUNEATON/Former Manor Park Community School, Beaumont Road	20	
362.	2098	COLESHILL/Motorway/Divisional Highways Depot, Coleshill Heath Road	20	
363.	5195	WARWICK/The Butts, Field Services Team	20	
364.	3261	RUGBY/Register Office, 5 Bloxham Place	20	
365.	4232	STRATFORD-UPON-AVON/Tyler House Youth & Community Centre, Tyler Street	19	
366.	1034	BEDWORTH/Heath Nursery & Children's Centre, Former Library	19	
367.	5245	WARWICK/The Old Clink, The Holloway	18	
368.	4389	STRATFORD-UPON-AVON/Winton House, Church Street	18	

	UPRN	Site	kWh/m2	Notes
369.	1132	NUNEATON/Former Park House Youth Centre, Riversley Road	18	
370.	1120	NUNEATON/Stockingford Primary School (former Infant), Cross Street	17	
371.	1161	NUNEATON/Library & Information Centre, Church Street	14	
372.	4097	HENLEY-IN-ARDEN/Fire Station, Station Road	11	
373.	1184	NUNEATON/Fire Station, Newtown Road	8	
374.	3288	RUGBY/Unit 5 1 - 3 Upton Road, 1 - 3 Upton Road	5	
375.	5192	WARWICK/Shire Hall Complex (2 Northgate Street), 2 Northgate Street	2	
376.	3111	RUGBY/Hill Street Community Youth Centre, Hill Street	2	
377.	1013	BEDWORTH/Youth Centre, Croxhall Street	0	
378.	1115	NUNEATON/Camp Hill Primary School, Hollystitches Road		Shared electricity
379.	2211	KINGSBURY/Swimming Pool, Tamworth Road		Shared electricity
380.	3119	RUGBY/Hunters Lane Household Waste Recycling Centre, Hunters Lane		No data
381.	3268	RUGBY/Library & Information Centre, Little Elborow Street		Shared electricity
382.	4012	ALCESTER/Library & Information Centre, Priory Road		No data
383.	4187	SOUTHAM/The Grange, Coventry Road		No data
384.	4208	STOCKTON/Household Waste Recycling Centre, Rugby Road		No data
385.	4250	STRATFORD-UPON-AVON/Mulberry Street Potential Site for Care and Choice		No data
386.	4309	WELLESBOURNE/C F M Workshops, Loxley Road		Shared electricity
387.	4317	STRATFORD-UPON-AVON/Arden House, Masons Road		Shared electricity
388.	5013	WARWICK/Budbrooke Highways Depot, Old Budbrooke Road		Shared electricity
389.	5042	KENILWORTH/Library & Information Centre, 11 Smalley Place		No data
390.	5191	WARWICK/16 Old Square, Kenilworth & Warwick Children		Shared electricity
391.	5197	WARWICK/Barrack Street Block, Barrack Street		Electricity shared with Shire Hall

	UPRN	Site	kWh/m2	Notes
392.	5287	WARWICK/Pageant House, 2 Jury Street		No data
393.	5361	LEAMINGTON SPA/Leamington Library & Information Centre, Royal Pump Room		No data
394.	5372	WARWICK/Wedgnock House, Warwickshire County Council		No data

Table 34 Properties ranked by decreasing electricity consumption per unit of floor area