

Warwickshire County Council

Building Energy Consumption Review

April 2017 to March 2018

Report prepared by WCC Resources Directorate - Enabling Services - Construction Services - Energy Team

https://www.warwickshire.gov.uk/buildingenergyperformance https://www.warwickshire.gov.uk/energy

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Summary



Introduction

This publication gives information about energy consumption (combined, then separate by utility) for buildings in the Warwickshire County Council (WCC) property portfolio for the financial year 2017/18 and compares it to data from previous years. (For property specific details - see Appendix).

Similar reports for previous years can be found on the internet on the WCC Energy Performance web page: <u>https://www.warwickshire.gov.uk/buildingenergyperformance</u>

Summary

Commentary

2018 is the 8th year WCC has undertaken annual building energy consumption reporting and benchmarking.

Since 15/16 schools and academies can no longer subscribe to an Energy Traded Service with WCC. As such, from 15/16 onwards WCC no longer has access the school's energy consumption data as granted by this relationship and therefore the scope of this report is limited to Corporate buildings only. For the purposes of this report, "Corporate buildings" are defined as those from which WCC operates its services. Therefore it does not include estate that is under WCC's demise but non-operational or let for 3rd party operation.

Не	Headline Overview: Change This Year vs Previous				
	CO ₂	Total Carbon Emissions in tonnes (t CO ₂)			
	Energy	Total Energy Consumption (kWh)			
+	Gas	Average cost per square metre (£/m ²)			
	Electricity	Average cost per square metre (£/m ²)			
	Water	Average cost per square metre (£/m ²)			
-	Renewables	Zero Carbon Generation - Installed capacity (kWp)			

With electronic invoice data, direct meter readings, voluntary automatic meter reading (AMR) installed and invoice validation, 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.
- Submission of 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 about unexpected patterns of energy consumption. Both higher than average and lower than average energy consumption need to be investigated to:

- Find out why this is the case,
- Better understand energy consumption and cost in WCC properties,
- Gather more accurate data where necessary,
- Detect avoidable energy wastage that otherwise may remain hidden,
- Learn from best practice in order to know what to do to reduce costs where energy performance can be improved,
- Identify areas for investment,
- Quantify potential savings from energy saving projects,
- Improve budget forecasting,
- Develop up to date Warwickshire specific benchmarks, and
- Set targets.

CO₂ Emissions



Introduction

The UK is committed to reducing its greenhouse gas emissions relative to 1990 levels, by at least 80% by 2050.

WCC's corporate energy target is to achieve at least an average annual 2.5% reduction in total CO_2 emissions from the corporate property estate per £million gross revenue expenditure.

WCC maintains a robust energy, cost and CO₂ reporting system for the WCC estate to assess actions and progress towards meeting targets.

In this section:

- 1. Reporting on Carbon Emissions Information on the UK Carbon Reduction Commitment CRC Energy Efficiency Scheme
- Carbon Dioxide Emissions Data Year on Year comparison table showing total tonnes of CO₂, floor area and property numbers for each utility.
- 3. Emission Factors Details on how CO₂ is calculated.
- CO₂ Equivalents Giving our emissions context.
- CO₂ Tonnes per £million of Gross Revenue Expenditure Our annual CO₂ emissions expressed in terms of the CRC reporting metric.

CO₂ Emissions

Reporting on Carbon Emissions

The Carbon Reduction Commitment CRC Energy Efficiency Scheme (also referred to as the 'CRC scheme' or 'CRC') is a mandatory carbon emissions reporting and pricing scheme designed to improve energy efficiency and cut carbon dioxide (CO_2) emissions in private and public sector organisations in the UK that are high energy users.

Participants in the CRC need to measure and report on their electricity and gas supplies annually from which CRC emissions are calculated, measured in tonnes of CO_2 . Participants are required to buy allowances for every tonne of CO_2 they emit relating to electricity and gas reported under the scheme.

The scheme is divided into a number of phases, with each phase lasting five years. Currently, the scheme is in its second phase running from April 2014 to March 2019. The UK government announced in 2016 that the CRC energy efficiency scheme will be abolished following the 2018-19 compliance year.

WCC was a participant in phase 1, but is not a participant in Phase 2 as it did not meet the qualification threshold in this period. As such it is no longer required to purchase CO₂ allowances.

Whilst not a participant in Phase 2, the 17/18 energy data was collected the same as if it formed part of the required CRC Evidence Pack. We maintain this structure as it provides a useful management tool for energy efficiency and also ensures continuity of reporting.

Carbon Dioxide Emissions Data 2017/18

Includes:	Year	Fuel kWh	No of properties	GIA (m²)	Emissions (t CO ₂)	
	2017/18				4,598	
y In'		Gas	65	92,015	2,063	
0 55		Electricity	83	100,842	2,535	
ding	2016/17				5,073	*
Buil		Gas	67	93,127	1,935	
ate		Electricity	87	101,431	3,138	
bor	2015/16				5,604	*
Cor		Gas	64	90,119	1,969	
		Electricity	84	103,024	3,635	
	2014/15				36,026	
SS		Gas	286	739,087	14,735	
ldin		Electricity	334	779,409	21,291	
Bui	2013/14				39,763	
rate		Gas	287	759,663	16,832	
hools & Corpor		Electricity	454	904,584	22,930	
	2012/13				43,902	*
		Gas	307	794,049	19,668	
		Electricity	412	842,899	24,234	
Sc	2011/12				37,978	
	2010/11				41,472	

* Including additional corporate emissions identified and CRC report corrected in 13/14,

previously the figure was 43,030 tonnes carbon dioxide.

* Corporate Buildings only, operational for whole reporting period

* from the 1st October 2016 WCC buys Green Tarrif Electricity



Carbon Dioxide Emission Factors

Emission Factors:

To convert kilowatt hours of Gas & Electricity into CO₂,

the following CRC Phase 2 Conversion Factors v7 are used, published 21st June 2017:

Natural Gas: 0.18381 kg CO₂ / kWh

Electricity: 0.38146 kg CO₂ / kWh (including transmission and distribution losses)

Carbon Dioxide Equivalents

Equivalents:

What does 4598 tonnes of carbon dioxide actually mean?

The graphics below give context by illustrating equivalents for 4598 tonnes of CO₂.

More information about these equivalents, how they are calculated and what assumptions are made, are available here: https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

Equivalency Results How are they calculated?

The sum of the greenhouse gas emissions you entered above is of Carbon Dioxide Equivalent. This is equivalent to:

Greenhouse gas emissions from

Passenger

driven for one

vehicles

vear

985

Carbon sequestered by

4,598 Metric Tons

•



CO₂ emissions from







Carbon Dioxide Tonnes per £million of Gross Revenue Expenditure

Tonnes of carbon dioxide per £million of gross revenue expenditure

The CRC reporting metric is tonnes of carbon dioxide per fmillion pounds of gross revenue expenditure. On this metric the lower the $CO_2/fmillion$ value, the better the performance. WCC will continue to report on this metric even though not a participant in Phase 2 of the CRC.

For financial year 2017/18 WCC's Gross Revenue Expenditure was: £613

Year		tonnes CO ₂ /£million Gross Revenue Expenditure		% change:
Schools & Corpo	orate Buildings			since 2010/11
	2010/11	63.01		
	2011/12	44.96	倉	-29%
	2012/13	57.47	₽	-9%
	2013/14	51.48	☆	-18%
	2014/15	48.16	7	-24%
Corporate Build	ings Only			since 2014/15
	2014/15	13.21		
	2015/16	9.60	Ŷ	-27%
	2016/17	8.47	¢	-36%
	2017/18	7.50	倉	-43%

(£millions)

Combined Energy Consumption (Electricity & Gas)



Introduction

This section details the combined electricity & gas consumption in kWh for WCC's buildings. It also identifies the largest contributing properties to the headline CO_2 figures from the previous section.

What's in this section:

1. Combined Consumption Data

Year on Year comparison table showing total kilowatt hours, floor area, property numbers and a weighted average cost per m² for each utility.

- Highest Consumers Chart showing the 20 highest consuming properties for the current year expressed in tonnes of CO₂.
- Proportional Split Chart showing the proportional contribution of gas & electricity towards our total combined consumption.
- 4. Weighted average cost per metre squared of floor area Explanation for how this metric is calculated

Combined Energy Consumption Data 2017/18

Includes:	Year	No of properties	wgt'd Av £/m²	GIA (m²)	Total kWh	
	2017/18	-			1	*
<u>ک</u>		86	£9.71	107,048	18,418,393	
ō	2016/17					
ilding		89	£9.22	107,428	18,162,905	
Bu	2015/16		•		•	
porate		88	£10.03	105,307	18,021,835	
Ğ	2014/15		-			
		94	£10.50	110,431	18,207,278	
	2013/14				:	*
rporate [s		-	-	-	119,396,522	
Cor ding	2012/13					
ools & Build		-	-	-	149,055,878	
Scho	2011/12				125,306,374	
•,	2010/11				154,939,304	

* Annual Review Weighted Average £/m² data not available pre 2014/5

* Corporate Buildings only, operational for whole reporting period



Combined Consumption Detail - 2017/18

Current Year Highest Consumers Overall:

The graph below shows the 20 highest emitters of Carbon Dioxide (in tonnes) for WCC's Corporate Portfolio. To give context to these values, the average across all properties is shown in orange (far right).



Combined Consumption Detail - 2017/18



Weighted average cost per square metre (fm^2)

WCC pays a range of tariff rates for gas and electricity across its portfolio relevant to the annual quantities supplied to each meter point.

In general terms, the cost per unit for gas is cheaper than the cost per unit of electricity, also the larger the annual quantity supply, the more preferential the unit rate.

To take account of these variances when generating a singular average cost value, a weighted average is used. The weighted average is calculated by dividing the total cost for the annual quantity of each gas and electricity supply by the gross internal area (GIA) in metres squared:

Total of annual costs per supply (£)

£/m² per utility =

Total floor area supplied (m²)

As some properties are not connected to both utilities, (e.g. electrically or oil heated), the combined GIA is not the same as the individual GIA's for gas and electricity. As such the combined \pm/m^2 is not the same as simply adding the average costs for gas plus the average cost for electricity, and is calculated as:

(Total £ Gas) + (Total £ Electricity)

Combined $fm^2 =$

Combined Floor area supplied (m²)

Gas Consumption



Introduction

This section provides a more detailed insight for the gas consumption figures measured in kilowatt hours, (kWh) that comprise the headline CO_2 and combined consumption data above. What's in this section:

1. Gas Consumption Data

Year on Year comparison table showing total kilowatt hours, floor area, property numbers and a weighted average cost per m² for gas.

- 2. Meter Statistics & Methodology Details on the gas meters included in our analysis and data preparation.
- Where We Use Our Gas
 Illustration of the relationship between gas consumption and floor area served for each benchmark property type.
- **4. Quartile Distribution** Illustration of the ranges of gas consumption observed within each benchmark property classification.
- Top Tens This year's highest and lowest gas consuming properties per unit of floor area.

Gas Consumption Data 2017/18

Includes:	Year	No of properties	wgt'd Av £/m²	GIA (m²)	Total kWh
	2017/18	-			
٧ [†]		65	£2.78	94,622	11,570,990
s Or	2016/17	-			
ilding		67	£2.56	95,802	10,858,983
e Br	2015/16	-			
rporate		64	£3.45	90,062	10,698,020
Ō	2014/15	-			
		68	£3.78	94,934	10,784,233
	2013/14				
rporate		287	-	759,663	77,265,868
Cor Ling	2012/13				-
ools & Build		307	-	794,049	106,880,545
Sch	2011/12	-			85,119,147
	2010/11				111,122,081

* Annual Review # Properties data not available pre 2012/3

* Annual Review Weighted Average £/m² data not available pre 2014/5

* Corporate Buildings only, operational for whole reporting period



Gas Consumption Detail 2017/18

Meter statistics and methodology

Gas Meter Statistics					
68	Total number of Meter Point Reference Numbers (MPRNs) included in our analysis.				
1	Exclusions (Non-WCC responsibility Disposal Less than 12 months operation)				

Gas Data Validation - Methodology

 Annual supply summaries are compiled using a Date Range apportionment of invoices per meter and per property supplied.

- Where meters serve more than one property the consumption is apportioned between the properties based on floor area.

- Where the meters serve a property that is partially tenanted, the consumption is apportioned based on floor area occupied by WCC.

- Properties grouped by operational type for comparative performance

- Cleansing, validation & cross checks for anomalies against invoice data held in WCC Energy Database based on:

Exclusions (as above)

Quartile outliers (Highest & Lowest) by Comparative Property Type/Group

Top 10 properties with largest year on year increase in consumption

Top 10 properties with the largest year on year reduction in consumption

Gas consumption by type of property and floor area

Where We Use Our Gas

The graph below shows comparative totals for the consumption (kWh) and the total floor areas (m²) for the different property types WCC operates. The data labels on the chart show the number of properties in each group.



Gas Consumption Detail 2017/18

Distribution of Gas Consumption per m² by property type

Quartiles by Property Type :

The quartiles chart below shows the expected ranges of consumption for each property type as a box & whisker plot.

The most frequently occurring range is represented by the two coloured boxes.

The Median Value for each group occurs on the division line between the two colours.

The lines (whiskers) show the deviation range for the sample.

The coloured dots show the "Highest" and "Lowest" value for each group.

"Outliers" are defined as values that are outside the range of the "whiskers" for each group.



Gas Consumption Detail 2017/18

Top Ten Highest & Lowest Gas Consumers Per m²

Current Year Highest & Lowest Consumers Overall

The graphs below show the 10 highest and 10 lowest consumers of gas per unit of floor area (kWh/m²). To give context to these values, the average across all properties is shown in orange (far right).





Electricity Consumption



Introduction

This section provides a more detailed breakdown for electricity consumption figures measured in kilowatt hours, (kWh) that comprise the headline CO_2 and combined consumption data above.

What's in this section:

- Electricity Consumption Data Year on Year comparison table showing total kilowatt hours, floor area, property numbers and a weighted average cost per m².
- 2. Meter Statistics & Methodology Details on the electricity meters included in our analysis and data preparation.
- 3. Where We Use Our Electricity Illustration of the relationship between gas consumption and floor area served for each benchmark property type.
- **4.** Quartile Distribution Illustration of the ranges of electricity consumption observed within each benchmark property classification.
- 5. Top Tens

This year's highest and lowest electricity consuming properties per unit of floor area.

Electricity Consumption Data 2017/18

Includes:	Year	No of properties	wgt'd Av £/m²	GIA (m²)	Total kWh
	2017/18				
Ę		83	£7.33	105,650	6,847,403
° Oi	2016/17				
iilding		87	£7.00	106,257	7,303,922
e Br	2015/16	_			
rporate		84	£7.23	102,967	7,323,814
Ō	2014/15	_			
		87	£7.40	108,187	7,423,045
0	2013/14				
porate s		454	-	904,584	42,130,654
Cor	2012/13				
ools & Builc		412	-	842,899	42,175,333
Schi	2011/12				40,187,227
	2010/11				43,817,223

* Annual Review # Properties data not available pre 2012/3

* Annual Review Weighted Average £/m² data not available pre 2014/5

* Corporate Buildings only, operational for whole reporting period



Electricity Consumption Detail 2017/18

Meter statistics and methodology

Electricity Meter Statistics:				
104	Total number of Meter Point Administration Numbers (MPANs) included in our analysis.			
1	Exclusions (Non-WCC responsibility Disposal Less than 12 months operation)			

Electricity Data Validation - Methodology:

 Annual supply summaries are compiled using a Date Range apportionment of invoices per meter and per property supplied.

- Where meters serve more than one property the consumption is apportioned between the properties based on floor area.

- Where the meters serve a property that is partially tenanted, the consumption is apportioned based on floor area occupied by WCC.

- Properties grouped by operational type for comparative performance

- Cleansing, validation & cross checks for anomalies against invoice data held in WCC Energy Database based on:

- Exclusions (as above)
- Quartile outliers (Highest & Lowest) by Comparative Property Type/Group
- Top 10 properties with largest year on year increase in consumption
- Top 10 properties with the largest year on year reduction in consumption

Electricity consumption by type of property and floor area

Where We Use Our Electricity:

The graph below shows comparative totals for the consumption (kWh) and the total floor areas (m²) for the different property types WCC operates. The data labels on the chart show the number of properties in each group.



Electricity Consumption Detail 2017/18

Distribution of Electricity Consumption per m² by property type

Quartiles by Property Type :

The quartiles chart below shows the expected ranges of consumption for each property type as a box & whisker plot.

The most frequently occurring range is represented by the two coloured boxes.

The Median Value for each group occurs on the division line between the two colours.

The lines (whiskers) show the deviation range for the sample.

The coloured dots show the "Highest" and "Lowest" value for each group.

"Outliers" are defined as values that are outside the range of the "whiskers" for each group.



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Electricity Consumption Detail 2017/18

Top Ten Highest & Lowest Electricity Consumers Per m

Current Year Highest & Lowest Consumers Overall:

The graphs below show the 10 highest and 10 lowest consumers of electricity per unit of floor area (kWh/m²).

To give context to these values, the average across all properties is shown in orange (far right).





Water Consumption



Introduction

Commercial water use is measured in litres and is split into three main elements; the fresh water consumed, sewerage and surface water drainage. This section provides a breakdown for the metered water consumption for the buildings WCC operates.

What's in this section:

- Water Consumption Data Year on Year comparison table showing total cubic litres, floor area, property numbers and a weighted average cost per m².
- 2. Meter Statistics & Methodology Details on the water meters included in our analysis and data preparation.
- Where We Use Our Water
 Illustration of the relationship between water consumption and floor area served for each benchmark property type.
- Quartile Distribution
 Illustration of the ranges of water consumption observed within each benchmark property classification.

Water Metered Consumption Data 2017/18

Includes:	Year	No of properties	wgt'd Av £/m²	GIA (m²)	Total Litres
	2017/18				
γIn		65	£1.67	89,314	41,741,371
0 s	2016/17				
uilding		65	£1.71	89,332	41,790,289
te B	2015/16				
orpora		65	£1.76	87,203	40,976,566
Ŭ	2014/15				
		-	-	-	-



Water Consumption Detail 2017/18

Meter statistics and methodology

Water Meter Statistics:				
107	Total number of Meters at properties included in our analysis.			
33	Exclusions: (Non-Metered Non-WCC responsibility Disposal Less than 12 months operation)			

Water Data Validation - Methodology:

- Estimates based on previous supplier statements,

- Where meters serve more than one property the consumption is apportioned between the properties based on floor area.

- Where the meters serve a property that is partially tenanted, the consumption is apportioned based on floor area occupied by WCC.

- Properties grouped by operational type for comparative performance

Cleansing & validation based on:

Exclusions (as above)

Quartile outliers (Highest & Lowest) by Comparative Property Type/Group

Water consumption by type of property and floor area

Where We Use Our Water:

The graph below shows comparative totals for the consumption (Litres) and the total floor areas (m²) for the different property types WCC operates. The data labels on the chart show the number of properties in each group.



Water Consumption Detail 2017/18

Distribution of Water Consumption per m² by property type

Quartiles by Property Type :

The quartiles chart below shows the expected ranges of consumption for each property type as a box & whisker plot.

The most frequently occurring range is represented by the two coloured boxes.

The Median Value for each group occurs on the division line between the two colours.

The lines (whiskers) show the deviation range for the sample.

The coloured dots show the "Highest" and "Lowest" value for each group.

"Outliers" are defined as values that are outside the range of the "whiskers" for each group.



Notes On Analysis



Introduction

Here we provide more background information for some of the overarching concepts that relate to the preparation of the figures for this annual building energy consumption review.

In this section...

- 1. Energy Benchmarking Information on why we split our portfolio into different property type categories for comparative analysis.
- 2. Year on Year Changes Contributory factors that influence the differences in consumption values reported year on year.
- **3.** WCC Building Performance vs Standard Benchmarks Categorised illustrations of building performance against Standard Energy Benchmarks.
- Degree Day Summary
 An explanation of what degree days are and how they can be used.

Energy Benchmarking

What are Energy Benchmarks?

The utility consumption sections of this report make reference to Energy benchmarking categories. Energy benchmarking means tracking a building's energy use and using a standard metric to compare the building's performance against past performance.

WCC conducts a range of public services from its corporate portfolio, and logically, any comparison between properties with different functions; such a household waste recycling centre and library, wouldn't be particularly meaningful.

Therefore, the buildings are split into categories based on their mode of operation, generating a standard metric for each type, so that meaningful comparisons between buildings can be made.

These comparisons can be used to drive energy efficiency upgrades, increase occupancy rates or improve property values. Benchmarks for smaller buildings may not necessarily be the same as for large buildings, even though they 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.

The lowest and highest outliers in each WCC category were investigated (for missing data, billing on estimates and consumption versus previous years) and excluded from developing these benchmarks if there were obvious reasons to do so.

WCC's Energy Benchmarks Categories

The Operational Categories used for Benchmarking WCCs Corporate Portfolio are:

- Fire Stations
- Libraries
- Offices
- Depots
- Household Waste Recycling Centres
- Business Units
- Museums
- Country Parks
- Car Parks
- Children's Centres
- Others

Energy Benchmarking

Energy Benchmark Values

The benchmark for each operational category is the median value identified in the quartiles chart within each utility section.

When interpreting these benchmarks consideration needs to be given to:

- The number of samples on which they are based (Benchmark values based on categories with fewer properties will be less robust)
- How closely comparable the operational parameters of the buildings within each category are likely to be (e.g. buildings within the "Libraries" group are more likely to have common function and hours of operation than those within the, "Depots" or "Others" categories.
- Buildings used for the same purpose vary in age and construction type and therefore energy performance.
- Buildings used for the same purpose may be open plan or cellular.
- WCC are only responsible for reporting energy consumption in communal areas of business centres, not units used by private businesses.
- 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. For instance, some may be open for clubs at night time or for community purposes at weekends and holiday periods.
- Some buildings used for the same purpose may be fully air conditioned; others may only have natural ventilation, others a combination.
- 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.

One writional Category	Utility Value (Year on Year Difference)					
Operational Category	Gas (kWh/m²)		Electricity (kWh/m ²)		Water (I/m ²)	
Fire Stations	+	190 (+12)	+	52 (-7)	+	403 (-31)
Libraries	†	123 (+9)	†	64 (+2)	†	159 (0)
Offices	+	127 (+10)	1	60 (+9)	+	384 (+8)
Depots	+	157 (+20)	+	38 (-42)	+	413 (0)
Household Waste Recycling Centres	+	65 (+8)	+	51 (-2)	>	1126 (0)
Business Units	1	35 (+2)	+	79 (-1)	>	347 (0)
Museums	+	109 (-25)	1	52 (+7)	1	216 (0)
Country Parks	Ŷ	- (n/a)	+	69 (-14)	+	3239 (0)
Car Parks	Ŷ	- (n/a)	+	172 (-278)		- (n/a)
Children's Centres	+	269 (+92)	+	37 (-11)	>	442 (0)
Others	1	133 (+8)	+	38 (0)	1	525 (0)
Range	e 35 to 269		37	' to 172	159) to 3239

WCC Energy Benchmarks

Year On Year Changes

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

Factors for consideration on the wide range of Year on Year values include:

Improvements

• Improvements following investigations into top 10s consumers

Practical:

• Exclusion of schools due to cessation of the Energy Traded Service.

Invoicing:

- There may be billing issues such as corrections, overcharges and refunds between years.
- There could be a high number of under-estimates or over-estimates on which invoices were paid rather than being based on customer reads where an actual read was not taken.

Physical:

- 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 etc.
- The property may have been vacated during the year resulting in low consumption.

Data:

- The meter may supply more properties than the supply address (e.g. Shire Hall supplies Barrack St). Where the buildings are not of similar construction and operation, the apportioning by m² methodology may not accurately reflect consumption for each building.
- The data sets that have been made available to us may be incomplete.
- Partial data availability due to property sale, purchase or change of supplier during the year.
- Meters accidentally read or reported in the wrong units (e.g. confusing gas ft³ & m³ units).

Past legislation:

- In 10/11 and 11/12 WCC was allowed to report on a total of only 93% of its total CO₂ emissions from electricity, gas and heating oil consumption. WCC were permitted to exclude some residual CO₂ emissions.
- Properties that were excluded in the 7% of emissions classed as residual and not reported. These
 were properties on the sensitive property list (to make future years more comparable as properties
 were disposed of) and all the ones with oil fired heating (due to difficulties in obtaining robust and
 accurate oil consumption data).
- Estimated supplies had to have a 10% uplift on reported emissions for the CRC Phase 1. In 13/14 4.6% of school electricity consumption and 6% of school gas consumption was from estimated readings.
- In 13/14 11.6% of non-school electricity consumption and 14.7% of non-school gas consumption was from estimated readings. Estimated readings artificially inflate reported emissions.
- In 12/13 the CRC rules changed and WCC had to report on 100% of its total CO₂ emissions, but from only electricity and gas 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.

• WCC is not included in phase2 of the CRC, however, reporting is maintained for consistency. **Environmental:**

- The winter of 12/13 was the second worst winter in 20 years. (note See Degree Days)
- The rules about CRC reporting allowed for no weather correction of consumption data for heating purposes.

Bubble Graph Performance against Standard Energy Benchmarks

The Guide F: Energy Efficiency in Buildings, from the Chartered Institution Of Building Services Engineers (CIBSE) outlines a set of values in kWh/m² for, "Typical", and "Good" practice energy efficiency benchmarks for an array of different building classifications.

Where an appropriate classification comparator exists, the charts that follow have been created to map individual WCC buildings performance set against these benchmarks in the form of a bubble chart.

How to interpret these charts:

- Property bubbles closer to the top right hand (Red) section of the plot area are associated with poorer performance and those closer to bottom left (Green) perform more efficiently.
- CIBSE Benchmark values for "Typical" and "Good" practice performance (kWh/m²) are displayed as vertical bars for gas and horizontal bars for electricity.
- The box formed by the intersection of these lines provides a "target" range for performance for that building type.
- The total annual cost (£) of gas and electricity for each individual site is represented visually by the size of the bubble. Therefore, the larger the bubble, the greater the cost.
- Average values for comparison have been created using the CIBSE "Typical" and "Good" practice benchmarks based on the formula:

=

(CIBSE kWh/m²) x (Category average m² WCC portfolio) x (WCC average utility cost/kWh Electricity) +

(CIBSE kWh/m²) x (Category average m² WCC portfolio) x (WCC average utility cost/kWh Gas)



- Southam and Fenny Compton Fire Stations have no gas for heating or hot water; subsequently they show high consumption for electricity.
- Electricity consumption at all Fire & Rescue properties is better than typical practice consumption levels.
- Gas consumption at all fire stations is better than good practice.



- Wolston, Polesworth and Whitnash libraries have no gas for heating or hot water; subsequently they show high consumption for electricity.
- Electricity consumption at Globe House, Bedworth and Coleshill is higher than typical practice and ways to improve performance need to be investigated.



• Gas consumption at all libraries is better than typical practice.

- Gas consumption at Rugby Register Office, The Saltway Centre and the Former Judges House is worse than typical practice and ways to improve performance need to be investigated.
- Electricity consumption at all offices is better than typical practice consumption levels.



• Budbrooke, Henley-in-Arden highways Depots have no gas for heating or hot water; subsequently they show higher consumption for electricity.



• Stockton, Burton Farm and Learnington HWRC have no gas for heating or hot water, subsequently they show high consumption for electricity.



• Electricity and gas consumption at Business Centres is better than good practice consumption level.



• Gas and electricity consumption at the County Record Office is higher than typical practice and ways to improve performance have been investigated – see Energy Saving Improvements - Case Study in 2016-17.



- Kingsbury Water Park OEC has no gas for heating or hot water; subsequently it shows high consumption for electricity.
- Electricity consumption at Marle Hall OEC is worse than typical practice and ways to improve efficiency need to be investigated.
- Gas consumption at Ratcliffe Youth and Community Centre is worse than typical practice consumption level and ways to improve efficiency need to be investigated.

Summary

The following buildings will be investigated:

Gas investigation	Electricity Investigation
Rugby Register Office,	Globe House library
The Saltway Centre	Bedworth library
Former Judges House	Coleshill library
Ratcliffe Youth and Community Centre	Marle Hall

Degree Day Summary 2017/18



What Are Degree Days & What Does This Graph Mean?:

- Put simply, Colder temperatures require Heating & Warmer temperatures, Cooling.

- Degree Days are used to give an index of how hot or cold the local weather is relative to a UK baseline of 15.5°Celcius.

- The chart above shows the total degree days in each year. - The Red Bars show Heating degree days and the the Blue Bars, Cooling. [note - Only Heating data is shown pre 2014/15]

- As both space heating and cooling require energy, we can infer a relationship between the total size of the Degree Day bars in the graph and the demand for energy used in Heating and Cooling Year on Year.
- In the commentary for factors affecting the year on year energy consumption; we noted that the winter of 12/13 was the second worst on record for 20 years. This is reflected in the height of the 12/13 heating bar in the graph above being largest of those shown.

Thus, with no other variables, you would expect the total energy consumption to be higher in years with larger bars and potentially a different mix of energy types consumed depending on the systems used for space heating & cooling (Electricity or Gas).

Low & Zero Carbon



Introduction

Renewable energy refers to energy generated by sustainable means, i.e. from resources that are naturally replenished on a human timescale, such as sunlight, wind, bio and hydro rather than fossil fuels.

The UK is committed to reducing its greenhouse gas emissions by at least 80% by 2050 relative to 1990 levels. The key EU targets for 2020 are:

- 20% cut in greenhouse gas emissions compared with 1990.
- 20% of total energy consumption to come from renewable sources.
- 20% increase in efficiency.

In this section ...

- Renewable Energy Generation Information on WCC's current investment in renewable technologies.
 Outlook
- A look at what WCC is planning for renewables and how capacity might change.

Renewable Energy Generation

What we're doing and why

WCC's Energy Policy is to increase the use of low and zero carbon technologies.

Alongside the non-polluting environmental benefits renewables offer, generating sustainable energy locally has additional potential benefits in terms of:

- Energy security (reducing our dependence on finite resources of fossil fuel);
- Economic benefits:
 - Protection against energy market volatility;
 - Reduction in carbon tariffs;
 - Local economic infrastructure and job creation borne of generating the energy we consume, rather than importing it via traditional means.

Since 2010/11 WCC has invested in a series of renewable energy technologies at a number of sites, including building integrated photovoltaic solar panels, wind turbine and biomass, generating some 210,000kWh annually.

In financial year 2015/16 WCC added another building integrated photovoltaic solar panel array, adding a further 10% (19,984 kWh), annually to its suite of renewable energy installations.

Set against the electricity consumed annually within WCC's corporate building portfolio for 17/18, WCC's current generation from renewable sources provides less than 5% of the total electrical energy demand or consumption meaning there is still ground to cover relative to the key EU target of 20% of total energy by 2020.

In line with its commitment to reduce carbon emissions, central government initially created a number of incentives to encourage the adoption of renewable technologies, such as the Feed in Tariff (FiT). Feed-in Tariff subsidy scheme for new small scale renewables projects will close next April.

As the industry surrounding renewables matures and the available technologies evolve, central government has been progressively reducing the value of these incentives schemes for new installations. The withdrawal of these financial incentives has had a negative impact on the viability and approval of small

scale renewable projects within WCC's estate in the short term. There are several market led factors that determine scale and timeline for WCC's developing its commitment to renewable energy generation.

Looking forward, WCC has been investigating ways to increase its renewable generation capacity (kW) by investing in Ground Mounted Solar (GMS) installations. Due to battery storage current economies, these projects are currently on hold.

Display Energy Certificates (DECs) & Advisory Reports (ARs) 2017/18



Introduction

In order to comply with the Energy Performance of Buildings Directive 2007 (EPBD), all buildings occupied by a public authority, with a useful floor area of over 250 m² and frequently visited by the public (i.e. every week they are open) are required to have a Display Energy Certificate (DEC).

In this section:

- 1. What are DECs & ARs? Background information on content, legal requirements and production
- 2. Production Procurement & Statistics Information on how our DECs & ARs are produced.
- 3. Corporate Property Profile Statistics on the ratings achieved by WCC Corporate Buildings
- 4. Performance Measuring How we measure the performance of our buildings
- 5. Improving DEC Ratings of Corporate Properties Methods for improving the energy performance of our building stock

DEC/AR Background & Procurement

What are DECs & ARs?

A Display Energy Certificate (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 banded performance rating on the certificate from A to G, where A has the lowest CO_2 emissions (best) and G the highest CO_2 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 CO_2 emissions would have a rating of 200 (or G).



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

- Those buildings with a floor area of 1,000 m² + need a DEC every year
- Those buildings with a floor area of between 250 m² and 1,000 m² require a DEC every ten years.

The Advisory Report accompanies the DEC and highlights recommendations to improve the energy performance of the building categorised by their potential short, medium and long term payback periods.

Advisory Reports issued before 09/01/14 for a building over 1000m² are valid for a period of 7 years, all Advisory Reports issued after this date are valid for 10 years regardless of building size.

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.

DEC/AR Background & Procurement

WCC DEC & AR Procurement

Following decommissioning of the WES traded energy efficiency service to schools in early 2015; WCC is no longer able to produce its own DEC/ARs but commissions them through the ESPO framework 343.

https://www.espo.org/Frameworks/Energy/343-Energy-Performance-of-Buildings-Surveying,-Ass

ESPO is a public sector owned professional buying organisation committed to pursuing best practice in procurement, sourcing, supply chain partner support and management, contract management and ensuring EU compliance.

ESPO was established in 1981 and is jointly owned by the following member authorities:

- 1. Leicestershire County Council
- 2. Lincolnshire County Council
- 3. Cambridgeshire County Council
- 4. Norfolk County Council
- 5. Warwickshire County Council
- 6. Peterborough City Council

From September 2015 onwards WCC commissed DECs / ARs for its own corporate property stock. Schools and academies are responsible for commissioning their own DECs / ARs.

WCC DEC & AR Production Statistics

	16/17 17/18			8
Property Type:	DECs	ARs	DECs	ARs
Academy	0	0	0	0
Maintained	0	0	0	0
Corporate	26	1	12	3
Total	26	1	12 3	

DEC Corporate Profile & Performance





DEC Corporate Profile & Performance

Performance Measuring

• 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.

DEC Corporate Profile & Performance

Improving DEC Ratings of Corporate Properties

Improving the energy performance of buildings that will be kept for the medium to long term could be achieved through projects such as:

- Implementing an effective maintenance and minor works programme to ensure optimum operational efficiency,
- Intelligent use of the Building Energy Management System (BMS),
- Improving insulation, heating & lighting systems, voltage control and server rooms,
- Improving the thermal performance of the building envelope,
- Implementing renewable and micro-generation energy systems,
- Low carbon whole building retrofits,
- Reducing the size of the WCC estate (property rationalisation) [note that moving to new benchmarks for increased space occupancy will increase energy use per unit of floor area, even though overall it may be better use of space],
- Procuring only buildings that fall into the top quartile of energy performance,
- Ensuring all new builds and major refurbishments (with a contract value of over £1M) achieve a BREEAM 'very good' rating,
- Ensuring all projects (with a contract value of between £350k to £1M) achieve minimum BREEAM credits in energy use / carbon reduction, water use, materials / waste minimisation and ecology,
- Rolling out smart metering ensuring accurate data, and
- Resourcing effective awareness raising and behaviour change campaigns.

Delivering such projects will have a positive effect on reducing the average DEC rating of the corporate estate and reduce carbon emissions.

Calculating Representative Average Utility Costs per Unit

Methodology

Reporting the cost per square metre (f/m^2) for a specific property presents a challenge if:

- The invoice data isn't complete or available in WCC's finance system (the ledger).
- The site doesn't procure through the Eastern Shires Purchasing Organisation (ESPO). The WCC Energy Team only receives invoice consumption and cost data from sites that procure through ESPO.
- The energy supply is shared between different properties on a site, or between sites.
- The energy supply is shared between tenancies within the properties served by those supplies.

Where invoice data is missing the WCC Energy Team derive a cost based on data given by the supplier with the caveat that estimation and apportioning is used to generate a consumption figure where the billing cycle does not align naturally to the financial year.

Where an energy supply is shared between properties, the consumption for the affected meter(s) is apportioned based on floor area (m²) only for the purposes of this analysis. This is a coarse methodology, as consideration is not given to other factors such as individual occupancy, operating hours and building fabric etc, but serves sufficiently for the purposes of this report.

Where an energy supply is shared between WCC and tenants within the building complex served, the consumption for the affected meter(s) is apportioned based on either:

- a) The proportion of energy costs (%) set out as the tenant's responsibility in their rental contract. Or
- b) The percentage of total floor area occupied by WCC.

The cost per kWh charged to each site will vary based on level of consumption, meter type and tariff. In light of this, we establish representative single costs per unit (pence/kWh) for gas and electricity based on a weighted average using the following approach:

- Using the WCC portfolio that procures through ESPO as a representative sample range of meter types, consumptions and tariffs.
- Using the contract rate for each supply, including billing factors such as standing charge and feed in tariff recovery charge, but excluding VAT; multiplied by annual consumption values per supply.
- Aggregating all the costs per supply then dividing this figure by the total consumption to achieve a weighted average cost per kWh consumed across the entire portfolio.

For water, the same basic principle was applied to establish a representative single cost per unit (pence/litre). Here the combined charges for fresh water, surface water drainage and sewerage (costs per supply) was divided by the Rolling Megalitres per Year (annual consumption).

Calculating Representative Average Utility Costs per Unit

Weighted Average Costs per Unit

This approach results in values of:

• Gas: 2.272 pence/kWh

Electricity: 11.333 pence/kWh

(including billing factors such as standing charge and feed in tariff recovery charge, but not VAT.)

• Water: 0.353 pence/litre of fresh water (estimate) (including billing factors such as surface water drainage and sewerage, but not VAT.)

Budget spent in 2017-18

The total spent in energy in 2017-18 amounted about £1,827,800.

Electricity	£	1,235,203
Gas	£	318,403
Calor Gas	£	1,514
Solid Fuel (Biomass)	£	7,068
Fuel Oil	£	6,377
Water Supply	£	259,164
Grand Total	£	1,827,729

Utility costs



Comparative Costs

Even though WCC uses more gas than electricity in its Corporate Portfolio, gas still only accounts for only ¼ of the total spend on energy.

With more than half of the billing for electricity made up of third party, or, non-commodity charges, changes to these charges have significant bearing on the majority of our spend looking forward.

Utility costs

WCC's Energy Contracts with ESPO

ESPO's Energy procurement is undertaken in accordance with a price risk strategy developed in consultation with the Governance Panel, a stakeholder group comprising of representatives from the main member authorities and other key stakeholders.

ESPO Price Risk Strategy – Pricing in Advance (PIA)

ESPO run a flexible procurement model for the supply of both gas and electricity, which requires small volumes to be bought periodically against wholesale market rates. Buying upfront at a fixed price aids budget security, but carries the risk that energy costs will be locked in when it might not be the opportune time to do so. The strategy of purchasing over a number of transactions, rather than all of the volume at once, spreads the risk over a longer period to achieve best blend of cost avoidance and cost certainty.

During next year, despite the wholesale price reductions secured by ESPO for the charging period, WCC expects to see prices rise in line with estimated 3rd party charge increases of between 0-5% for gas and electricity (dependent on volumes and standing charges). High demand users within the peak charging periods may see higher cost increases.

WCC's Electricity is 100% Renewable Energy from October 2016

In October 2016, WCC signed a new contract with ESPO for electricity procurement. Total Gas & Power supplies electricity for this contract.

Through this contract WCC now procures 'Pure Green Energy' for an extra 0.02p/kWh (this charge is reviewed annually and subject to change). Pure Energy comes from 100% renewable sources (solar, wind, and hydro/wave but doesn't include biomass).



Pure green generation mix compared to standard fuel mix.

Appendix

Appendix 1: Combined Electricity & Gas Consumption 2017/18

(Corporate Buildings Only)

Appendix 1: Combined	Electricity & Gas C	onsumption 2017/18	(Corporate Buildings Only)
		· · · · · · · · · · · · · · · · · · ·	

			2017/18		2016/17
UPRN	Name	kWh/m ²	£/m2	Total CO₂ (Tonnes)	£/m2
1128	Nuneaton Training Centre	216	£3.91	9	£10.49
1033	Bedworth Library & Information Centre	244	£12.49	44	£12.27
1037	Warwickshire Fire & Rescue Training & Dev. Centre	243	£12.90	39	£10.94
1050	Bedworth Fire Station	221	£9.20	26	£8.17
1097	Centenary Business Centre	161	£15.55	183	£14.24
1157	Hatters Space Community Centre	166	£8.60	38	£8.54
1161	Nuneaton Library & Information Centre	147	£4.15	42	£4.38
1184	Nuneaton Fire Station	271	£10.17	105	£9.63
1188	The Hilary Road Centre	182	£9.30	48	£7.79
1242	Kings House	216	£11.77	158	£9.82
1259	Transport Depot, Units D2, D3 & D4 Greenwood Court	21	£2.40	3	£1.46
1270	Eliot Park Innovation Centre	203	£16.61	267	£15.96
1287	Camp Hill Education Sports & Social (CHESS)	143	£7.50	47	£6.75
2017	The Ratcliffe Youth & Community Centre	374	£9.54	16	£8.02
2027	Atherstone Library & Information Centre	129	£7.04	19	£6.49
2036	Atherstone Fire Station	312	£12.60	33	£11.86
2080	Coleshill Fire Station	238	£8.63	49	£7.47
2129	Hartshill Hayes Country Park	156	£17.73	3	£18.04
2143	Kingsbury Water Park	35	£3.98	27	£3.22
2168	Polesworth Library & Information Centre	120	£13.65	10	£12.71
2171	Polesworth Fire Station	276	£11.79	16	£12.44
2214	Pooley Country Park	69	£7.83	7	£8.45
2224	Coleshill Library & Information Centre	271	£12.10	13	£12.07
2232	Kingsbury Outdoor Learning Centre	37	£4.19	5	£5.13
2233	Lower House Farm Household Waste Recycling Centre	7	£0.82	8	£0.72
2239	The Arden Centre	193	£8.30	19	£7.47
3037	Dunchurch Highways Sub-Depot	45	£2.70	25	£2.66
3119	Hunters Lane Household Waste Recycling Centre	65	£1.48	3	£2.01
3144	Rugby Fire Station	269	£10.38	78	£8.99
3148	Fawsley House	158	£7.15	49	£7.52
3152	The Bridge	163	£6.11	14	£5.92

3205	Ryton Pools Country Park	129	£14.57	33	£10.42	
3225	Wolston Library & Information Centre	82	£9.35	5	£13.46	
3243	Oakfield Park	126	£8.06	39	£6.49	
3260	Sir Frank Whittle Business Centre	56	£2.74	36	£3.05	
3261	Rugby Register Office	423	£14.86	14	£12.75	
3288	Unit 5, 1 - 3 Upton Road	46	£3.50	3	£3.14	
4016	Alcester Fire Station	80	£6.37	12	£9.09	
4055	Bidford On Avon Fire Station	132	£6.13	11	£4.93	
4074	Fenny Compton Fire Station	100	£11.29	6	£14.00	
4097	Henley-In-Arden Fire Station	161	£5.33	20	£5.24	
4099	Henley-In-Arden Highways Sub-Depot	104	£11.80	26	£11.69	
4185	Southam Fire Station	166	£18.81	11	£14.08	*2
4194	Shipston on Stour Library & Information Centre	129	£4.89	6	£4.15	
4199	Shipston-On-Stour Fire Station	239	£10.28	13	£6.73	
4204	Shipston-On-Stour Highways Sub-Depot	36	£4.13	10	£4.45	
4234	Stratford-Upon-Avon Library & Information Centre	145	£6.41	40	£7.72	
4245	Stratford-Upon-Avon Fire Station	254	£11.18	48	£10.71	
4255	The Saltway Centre & Stratford Family Centre	363	£14.11	58	£10.15	
4305	Wellesbourne Library & Information Centre	183	£9.71	11	£6.94	
4308	Wellesbourne Divisional Highways Depot	201	£8.04	20	£12.34	
4309	Wellesbourne C F M Workshops	195	£7.90	34	£11.65	
4367	Wellesbourne Fire Station	223	£8.65	16	£10.76	
4388	Stratford upon Avon Park and Ride	172	£19.51	7	£66.24	*3
5010	Trading Standards Headquarters	176	£9.71	61	£8.96	
5012	Budbrooke County Highways Head Office	172	£9.62	22	£8.47	
5013	Budbrooke Highways Denot	517	f58 56	13	f55 25	*4
5042	Kenilworth Library & Information Centre	81	£1.84	14	£1.82	
5043	Cherry Orchard Household Waste Recycling Centre	0	-f0.05	0	f0.04	
5058	Kenilworth Fire Station	319	f15.04	20	f13.02	
5097	Round Long Training Contro	166	£7.06	52	f6 54	_
5106	Loamington STEDS 42 Bugby Poad	163	£4.51	4	£4.40	
5110	Lillington Library & Information Contro	180	£6.99	19	f6 11	
5110	Learnington Library & Information Centre	51	£5.79	15	£6.00	
5124	Learnington Household Waste Recycling Centre	255	£12.93	231	£11.80	_
5124	Nutan Sports Cround and Davillion	54	£6.17	231 A	£5.66	_
5182		105	£11 70	761	£10.84	
5100		274	£12.07	61	£10.04	
5190	Former Judges House	189	£12.07	64	£10.84	
5190	Barrack Street Block	200	£11.91	305	£10.82	
5199	Premises At Montague Road	215	£7.59	309	£6.61	
5247	St John`s House Museum	137	£5.77	42	£6.08	
5248	County Museum (Market Hall)	279	£15.10	59	£7.58	
5252	County Record Office	160	£8.34	62	£15.46	_
5254	Priory Bungalow	533	£14.67	8	£21.93	
5208	Whitnash Library & Information Centre	106	£7.49 £11.98	11	£0.08	-
		100			/_T	and the second s

6002	Marle Hall Outdoor Education Centre	226	£9.75	98	£8.55
5384-1	Saltisford Office Park 1	161	£12.75	105	£11.06
5384-2	Saltisford Office Park 2	147	£10.88	70	£14.26
5384-3	Saltisford Office Park 3	148	£13.26	217	£12.33
4235	Burton Farm Household Waste Recycling Centre	185	£20.93	13	£16.85
1095	Hammond Business Centre				
2098	Coleshill Motorway/Divisional Highways Depot	41	£4.69	34	£7.84

Summary

The following sites will be investigated:

- *1 Eliot Park Innovation Centre
- *2 Southam Fire Station
- *3 Stratford-upon-Avon Park and Ride
- *4 Budbrooke Highways Depot Investigation started, small works (light sensors, door closer)

Appendix 2: List of investigations

Gas investigation
Rugby Register Office
The Saltway Centre
Former Judges House
Ratcliffe Youth and Community Centre
Electricity Investigation
Globe House library
Bedworth library
Coleshill library
Marle Hall
£/m2 Investigation
Eliot Park Innovation Centre
Southam Fire Station
Stratford-upon-Avon Park and Ride
Budbrooke Highways Depot – Investigation started, small works (light sensors, door closer)

Appendix 3 - WCC Corporate Property Display Energy Certificate Profile

Site Code	Site Name	Grade	Rating
1161	Nuneaton Library & Information Centre	В	39
4097	Henley-In-Arden Fire Station	В	50
1050	Bedworth Fire Station	С	51
5247	St John`s House Museum	С	53
2027	Atherstone Library & Information Centre	С	58
3243	Oakfield Park	С	58
2080	Coleshill Fire Station	С	59
5042	Kenilworth Library & Information Centre	С	59
5136	Holly Walk House	С	59
4389	Winton House	С	60
5199	Premises At Montague Road	С	60
3152	The Bridge	С	62
2239	The Arden Centre	С	64
3148	Fawsley House	С	65
5268	Myton Park Centre	С	65
2232	Kingsbury Water Park Outdoor Education Centre	С	66
4234	Stratford-Upon-Avon Library & Information Centre	С	66
5199	Premises At Montague Road	С	69
3144	Rugby Fire Station	С	70
4245	Stratford-Upon-Avon Fire Station	С	70
5124	Fire & Rescue Service Headquarters	С	70
5252	County Record Office	С	72
5293	Whitnash Library & Information Centre	С	72
1188	The Hilary Road Centre	С	74
5110	Lillington Library & Information Centre	D	76
5384	Saltisford Office Park	D	77
5097	Pound Lane Training Centre	D	78
1242	Kings House	D	79
4004	Globe House	D	80
1033	Bedworth Library & Information Centre	D	83
1184	Nuneaton Fire Station	D	83
4255	The Saltway Centre & Stratford Family Centre	D	84
1287	Camp Hill Education Sports & Social (CHESS)	D	86
5384	Saltisford Office Park	D	88
5248	County Museum (Market Hall)	D	89
5010	Trading Standards Headquarters	E	102
1157	Hatters Space Community Centre	E	107
5187	Shire Hall Complex	E	109
5384	Saltisford Office Park	E	109
5196	Northgate House Conference Centre	E	113
5103	The Fordsfield Complex Needs Centre	E	117
1037	Warwickshire Fire & Rescue Training & Dev. Centre	E	125
1198	Ramsden Complex Needs Centre	F	142

Appendix 4 - Links

Historic Building Energy Review Reports

Similar reports for previous years can be found on the internet on the WCC Energy Performance web page:

https://www.warwickshire.gov.uk/buildingenergyperformance

- 2010/11 Building Energy Consumption Review
- 2011/12 Building Energy Consumption Review
- 2012/13 Building Energy Consumption Review
- 2013/14 Building Energy Consumption Review
- 2014/15 Building Energy Consumption Review
- 2015/16 Building Energy Consumption Review
- 2016/17 Building Energy Consumption Review

Direct access to the last report from the link: https://apps.warwickshire.gov.uk/api/documents/WCCC-599-76

These documents contain further information about energy management at WCC.

Energy Web Pages

The following energy related web pages have been maintained.

• Home > Environment > Energy

Energy Plan: http://www.warwickshire.gov.uk/energyplan

Energy Strategy Policy: <u>http://www.warwickshire.gov.uk/energystrategyandpolicy</u>

Building Energy Performance: <u>https://www.warwickshire.gov.uk/buildingenergyperformance</u>

Energy Resources: <u>http://www.warwickshire.gov.uk/schoolenergy</u>

