



University of  
Nottingham  
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# Annual Energy Report 2017/18

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# **2017/18 Energy Report**

## **Contents**

<b>Executive Summary</b>	<b>2</b>
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### **Section 1 – Total Energy Report**

1.A - Energy and Water Costs Summary	3
1.B - Energy costs per square metre for each Campus	4
1.C - Climate Change Levy and VAT	4
1.D - 2015/16 Costs Broken Down by Campus and Utilities	5
1.E - Energy Use Summary	6
1.F - Energy Use Breakdown by Campus and Utilities	7
1.G - Energy Usage and Cost Comparison with Area	8
1.H - Energy Usage and Cost per UK Student	9
1.I - Utility Costs as a Proportion of University Spending	10
1.J - The Carbon Reduction Commitment Energy Efficiency Scheme	10
1.K - Energy Costs comparison to Other Universities	11
1.L - Energy Efficiency comparison to Other Universities	12

### **Section 2 – Electricity, Gas and Water data**

2.A - Electricity Consumption	13
2.B - Electricity Costs	14
2.C - Fossil Fuel Consumption	15
2.D - Fossil Fuel Costs	16
2.E - Water Consumption	17
2.F - Water Costs	18

### **Section 3 – Environmental Considerations**

3.A - Weather Data – Degree Days	19
3.B - Changes since Base Year (2005/6)	20
3.C - University Renewable Energy Generation	20

### **Section 4 – Appendices – Detailed billed data**

4.A - Appendix A – Buildings constructed since 2005/6	21
4.B - Appendix B – Electricity Data	22
4.C - Appendix C - Fossil Fuel Data	23
4.D - Appendix D – Water Data	25



## **Executive Summary**

Overall energy and water costs were £12.2 million in 2017/18, an increase of 5% from the previous year. Market energy prices rose considerably more than this and even higher costs were avoided by purchasing early in the year.

Energy consumption increased by 3.4% year on year but overall floor area was up by 2.6%, student numbers were up by 2.1%, and the weather was markedly colder.

Both our energy consumption per square metre and per student remained below the Russell Group average.

### **Key statistics:-**

**Energy and water costs**, excluding taxes, increased by 5% to £12.2m in 2017/18

**Energy consumption** was up by 3.4%. Gas increased by 2.4% and electricity was up 4.9%.

**Water usage** decreased by 11%.

### **Other observations:-**

**Utility costs/m<sup>2</sup>** up 3.0% to £19.93, including taxes.

**Energy consumption/m<sup>2</sup>** up 0.7% to 302kWh/m<sup>2</sup>

**Energy costs/student** up 3.5% to £398

**Energy consumption/student** up 1.3% to 6,037kWh

### **External factors:-**

The weather was considerably colder, indicating an increase in gas usage of 7.7% in a like for like situation (see section 3.A on P.19). The University continues to grow and floor area rose by 2.6% in '17/18 and student numbers increased by 2.1%

The University has published an annual report showing trends in our energy and water usage every year since 1998. With the increasing attention on carbon emissions, some elements of this report have now been subsumed within the University's Carbon Management Plan (CMP) Annual Report 2017/18. However, we will continue to produce the Energy and Water Report to allow direct comparison on the key areas of utility consumption and costs with earlier years.

Note that most figures relate to the University's financial year of August 1st 2017 to July 31st 2018, with the baseline for comparison being the previous (2016/17) financial year. Utilities continue to be procured via Notice Ltd, which is a wholly owned subsidiary of the University of Nottingham.

<sup>1</sup>[www.nottingham.ac.uk/sustainability](http://www.nottingham.ac.uk/sustainability)

## **Section 1 – Total Energy Report**

### **1.A. - Energy and Water Costs Summary**

Overall energy and water costs were £12.2 million in 2017/18, an increase of 5% from the previous year.

Our electricity costs were up 7%, gas costs up 6%, whilst water costs fell by 5%. This was actually a good purchasing performance as our procurement strategy allowed us to mitigate much larger market rises by purchasing most of the energy early in the year, when prices were relatively low. From April 2017, our energy contracts were moved within the TEC (The Energy Consortium) framework, but continue to be on a flexible purchasing basis.

The disproportionately high increases at Sutton Bonington were due to the cost of additional imported electricity as a result of lower running hours for the site's CHP engines, whilst Jubilee Campus increases are largely due to new buildings.

<b>Energy and Water Costs</b>				<b>Change</b>
	<b>2015/16</b>	<b>2016/17</b>	<b>2017/18</b>	<b>'16/17 to '17/18</b>
University Park	£ 5,886,335	£ 6,492,810	£ 6,720,439	4%
Sutton Bonington	£ 1,647,709	£ 1,688,096	£ 1,886,924	12%
Jubilee Campus	£ 1,135,665	£ 1,513,842	£ 1,759,356	16%
Others	£ 657,604	£ 733,452	£ 753,324	3%
Medical School	£ 1,382,354	£ 1,167,173	£ 1,077,620	-8%
<b>Total</b>	<b>£ 10,709,666</b>	<b>£11,595,373</b>	<b>£12,197,663</b>	<b>5%</b>

Figure 1.A.1 Table of energy and water costs for last 3 years split by campus.

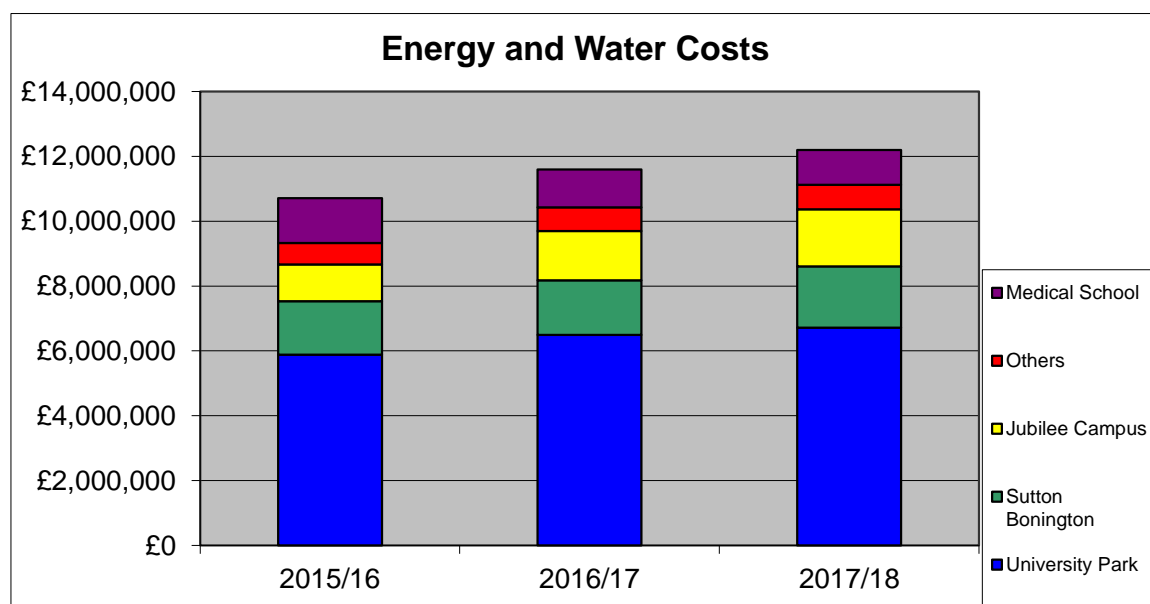


Figure 1.A.2 Graph of net energy and water costs for the last 3 years split by campus.

Note that these figures exclude VAT and Climate Change Levy, which are discussed on page 4.

## 1.B. – Utility costs per square metre for each Campus

Campus Costs	Cost/sq.m/annum				
	Floor Area	Electricity	Heating	Water	Total
University Park	354,090	£12.82	£3.84	£2.32	£18.98
Sutton Bonington	77,293	£13.64	£5.64	£5.13	£24.41
Jubilee Campus	106,981	£11.22	£3.63	£1.59	£16.45
Others	69,880	£6.72	£2.77	£1.28	£10.78
Medical School	77,644	£7.41	£5.49	£0.98	£13.88
<b>Total</b>	<b>685,888</b>	<b>£11.43</b>	<b>£4.09</b>	<b>£2.26</b>	<b>£17.78</b>

Figure 1.B.1 Table of energy costs per square metre, split by campus.

Note that the Medical School costs were £27.77/square metre in 2013/14, meaning that we have halved the energy costs of this site over a four-year period. This was primarily due to fitting new electric-powered chillers and removing the elderly steam powered adiabatic chillers and cooling towers.

Note that if taxes (VAT and CCL, see below) are taken into account, our average utility costs are now £19.92 per square metre per annum.

## 1.C - Climate Change Levy (CCL) and VAT

VAT costs paid by Notice Ltd on energy bills increased by 6% to £1.14 million in 2017/18, and CCL also increased to £326,000.

The Climate Change Levy (CCL) is a tax on energy consumption that was introduced in April 2001. On April 1<sup>st</sup> 2018 the rates rose 2.5% to 0.203p/kWh on gas and 2.6% to 0.583p/kWh on electricity.

If the taxes were included in the total expenditure on utilities the totals can be seen below:-

	2017/18				2016/17	%
	Electricity	Fossil Fuels	Water	Totals	Totals	Diff
Utility Costs	£ 7,840,716	£ 2,804,067	£ 1,552,880	£ 12,197,663	£11,595,373	5.2%
Climate Change Levy	£ 241,280	£ 84,523	-	£ 325,804	£256,932	26.8%
Value Added Tax	£ 847,585	£ 296,423	-	£ 1,144,008	£1,076,928	6.2%
<b>Total</b>	<b>£ 8,929,581</b>	<b>£ 3,185,013</b>	<b>£ 1,552,880</b>	<b>£13,667,475</b>	<b>£12,929,233</b>	<b>5.7%</b>

Figure 1.C.1 Table of energy and water costs including Climate Change Levy and Value Added Tax.

## 1.D - 2017/2018 Net Costs Broken Down by Campus and Utilities

Energy and Water Costs				
2017/18	Electricity	Fossil Fuels	Water	Total
University Park	£ 4,540,046	£ 1,360,393	£ 820,000	£ 6,720,439
Sutton Bonington	£ 1,054,461	£ 435,854	£ 396,609	£ 1,886,924
Jubilee Campus	£ 1,200,752	£ 388,000	£ 170,604	£ 1,759,356
Others	£ 469,837	£ 193,819	£ 89,667	£ 753,324
Medical School	£ 575,620	£ 426,000	£ 76,000	£ 1,077,620
<b>Total</b>	<b>£ 7,840,716</b>	<b>£ 2,804,067</b>	<b>£ 1,552,880</b>	<b>£12,197,663</b>

Figure 1.D.1 Table of energy and water costs split by campus and by utility

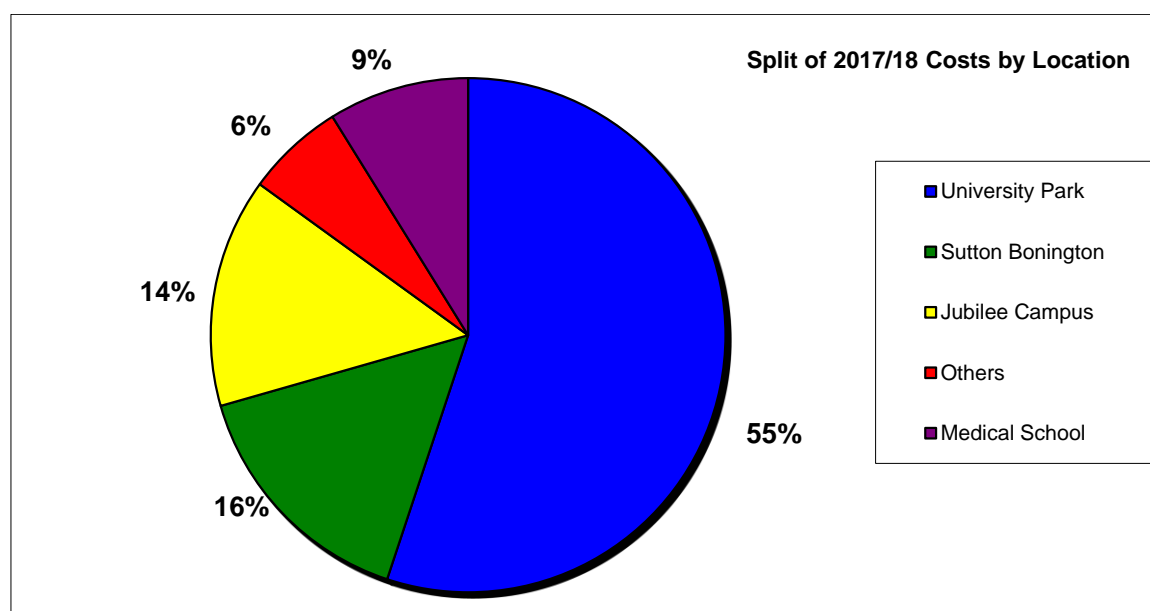


Figure 1.D.2 Chart of energy and water costs split by campus

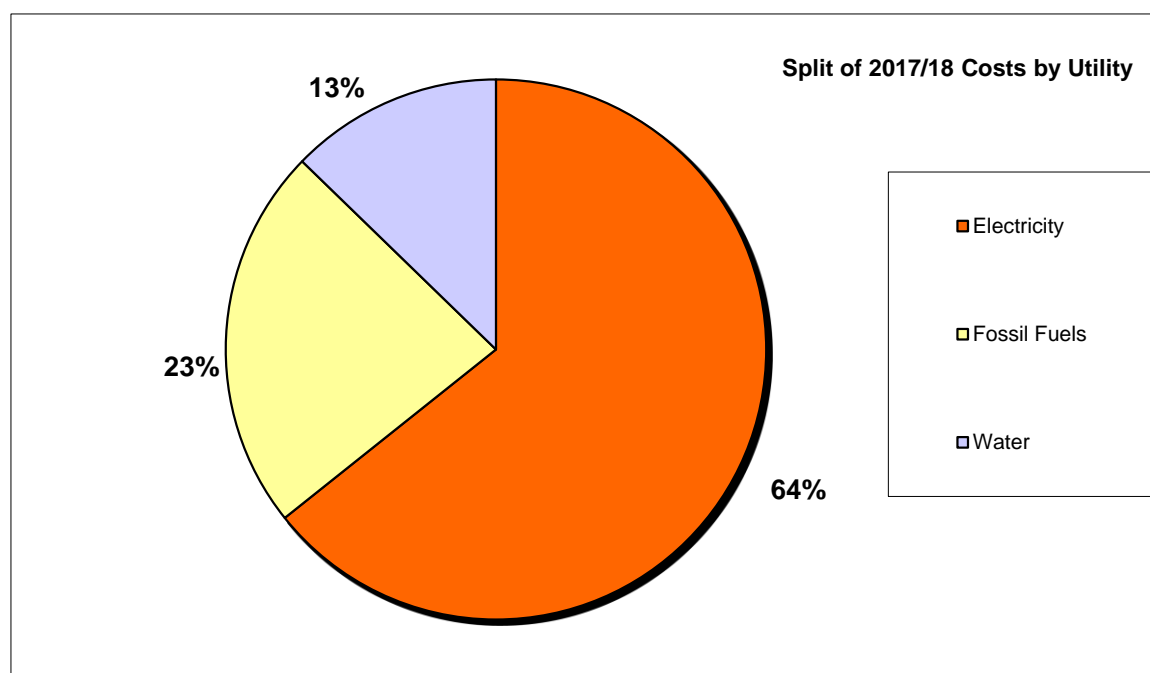


Figure 1.D.3 Chart of energy and water costs split by utility type

## 1.E - Energy Use Summary

Energy consumption, i.e. the total of gas and electricity, increased by 3.4% year on year even though floor area was up by 2.6%, student numbers were up by 2.1%, and the weather was significantly colder, indicating a requirement for 7.7% more heating fuels.

If the effects of the weather and new buildings are removed, then in a like-for-like comparison, consumption for the last year would have been 192,489 MWh, a reduction of 4.0%.

As described later in this report, the figures at Sutton Bonington have been affected by the relative lack of availability of the site's CHP units compared to the previous year. The relatively large increase at Jubilee is due to the new RAD and AMB buildings, (an increase of 11,380 sq. m.) which added 12% to the floor area of the campus. The rises at the other campuses are primarily down to the colder weather.

Energy Consumption	MWh	MWh	MWh	Change
	2015/16	2016/17	2017/18	'16/17 to '17/18
University Park	108,945	108,663	114,070	5.0%
Sutton Bonington	32,292	34,402	30,321	-11.9%
Jubilee Campus	17,143	21,309	24,324	14.2%
Others	12,933	12,806	13,649	6.6%
Medical School	28,221	23,283	24,890	6.9%
<b>Total</b>	<b>199,535</b>	<b>200,462</b>	<b>207,254</b>	<b>3.4%</b>

Figure 1.E.1 Table of energy usage for the last 3 years split by campus.

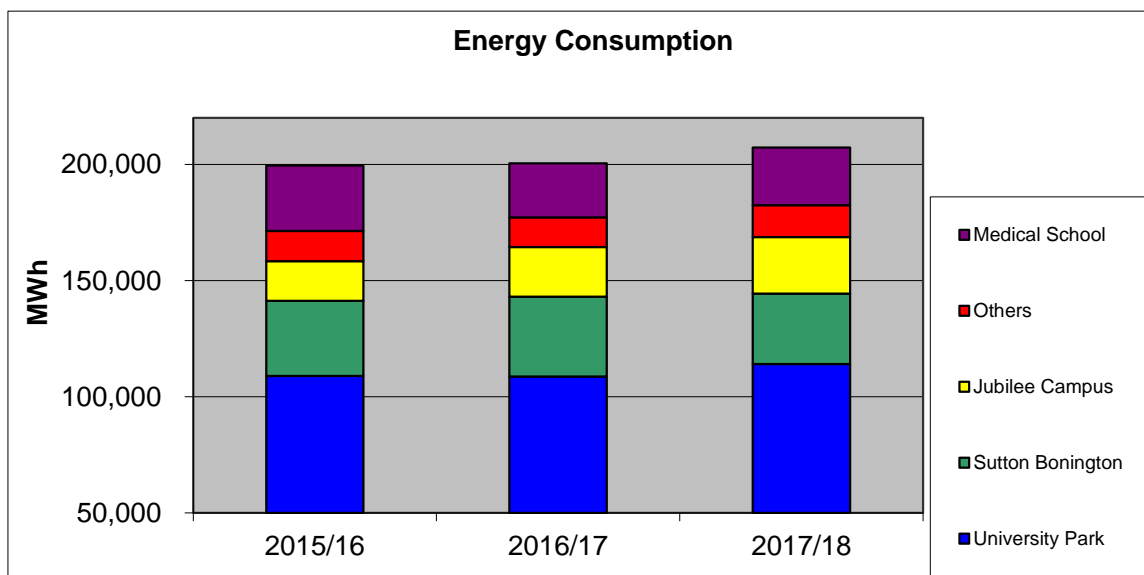


Figure 1.E.2 Graph of energy consumption for the last 3 years split by campus

## 1.F - Energy Use Breakdown by Campus and Utilities

Energy Consumption	MWh	MWh	MWh
2017/2018	Electricity	Fossil Fuels	Total
University Park	48,210	65,859	114,070
Sutton Bonington	11,180	19,141	30,321
Jubilee Campus	12,039	12,285	24,324
Others	4,747	8,902	13,649
Medical School	9,290	15,600	24,890
<b>Total</b>	<b>85,468</b>	<b>121,787</b>	<b>207,254</b>

Figure 1.F.1 Table of energy consumption split by campus and by utility

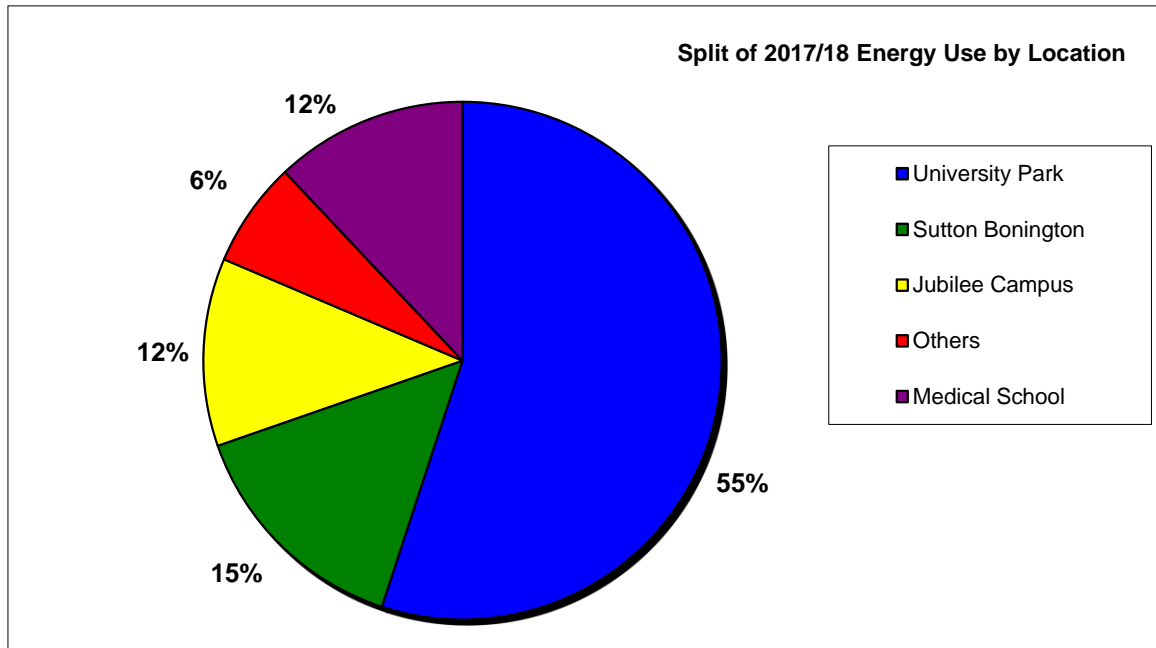


Figure 1.F.2 Pie chart of energy consumption split by campus

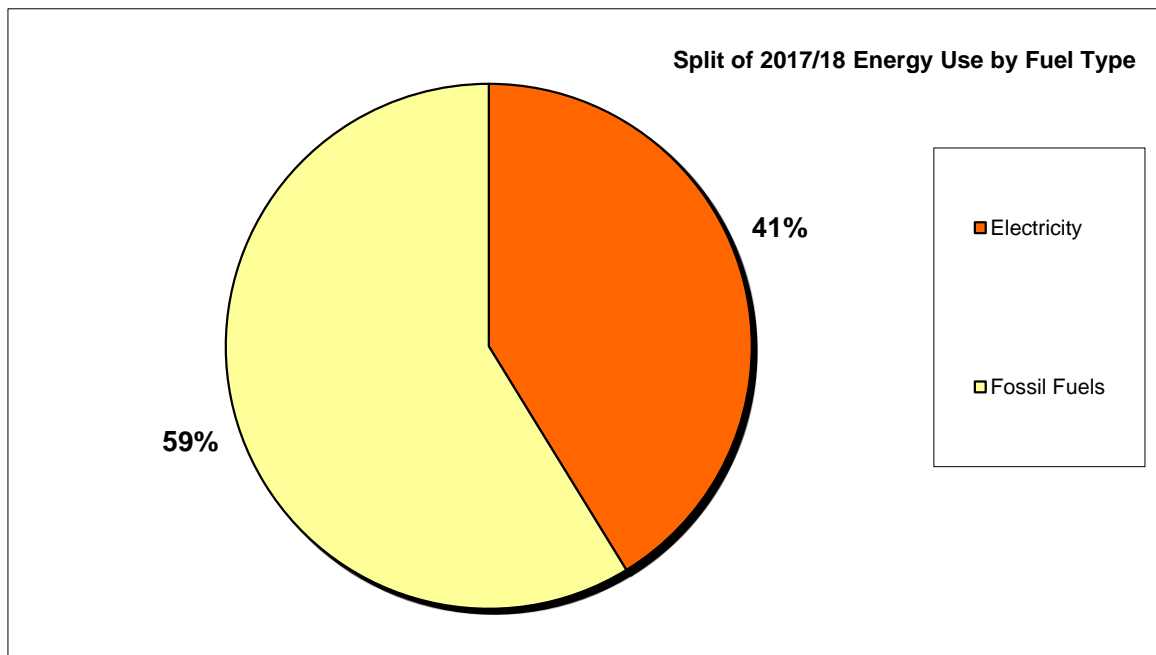


Figure 1.F.3 Pie chart of energy consumption split by utility type.



## 1.G - Energy Usage and Cost Comparison with Gross Premises Area

	2014/15	2015/16	2016/17	2017/18	Change
Floor Area (sq.m.)	633,307	642,056	668,226	685,888	2.6%
Annual Energy Usage (MWh)	203,001	199,535	200,462	207,254	3.4%
<b>Energy Usage Per sq. m. (kWh/m2)</b>	<b>321</b>	<b>311</b>	<b>300</b>	<b>302</b>	<b>0.7%</b>

Figure 1.G.1 Table of last four years energy usage and floor area.

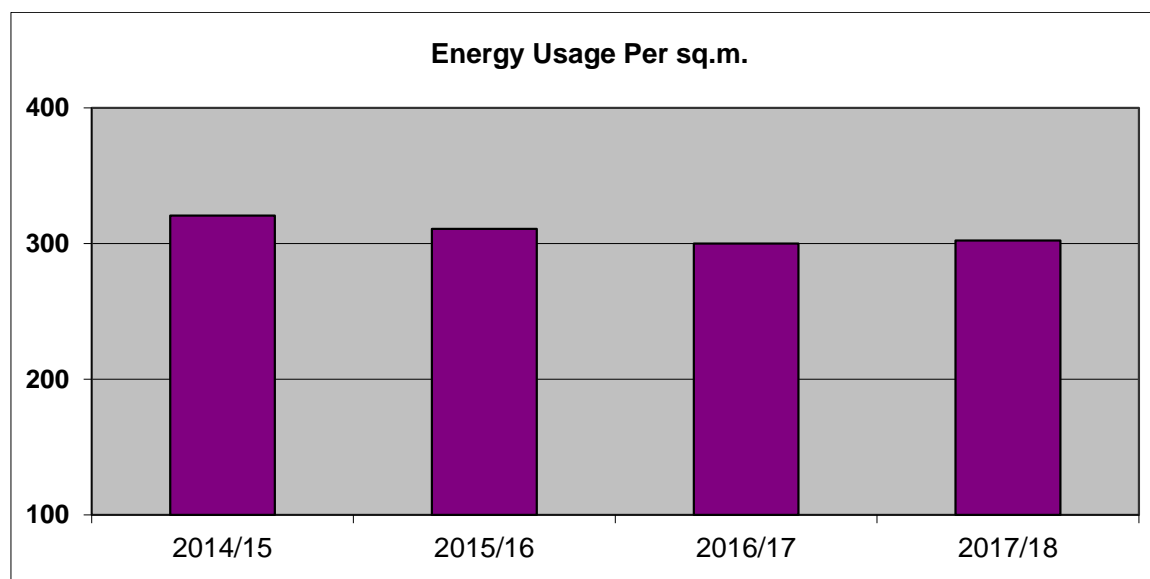


Figure 1.G.2 Graph of energy usage per unit floor area for the last four years.

	2014/15	2015/16	2016/17	2017/18	Change
Floor Area (sq.m.)	633,307	668,226	668,226	685,888	2.6%
Gross Energy and Water Costs	£12,749,351	£11,955,000	£12,929,233	£13,667,475	5.7%
<b>Utility Cost Per sq. m.</b>	<b>£ 20.13</b>	<b>£ 17.89</b>	<b>£ 19.35</b>	<b>£ 19.93</b>	<b>3.0%</b>

Figure 1.G.3 Table of last four year gross energy and water costs and floor area (excluding taxes).

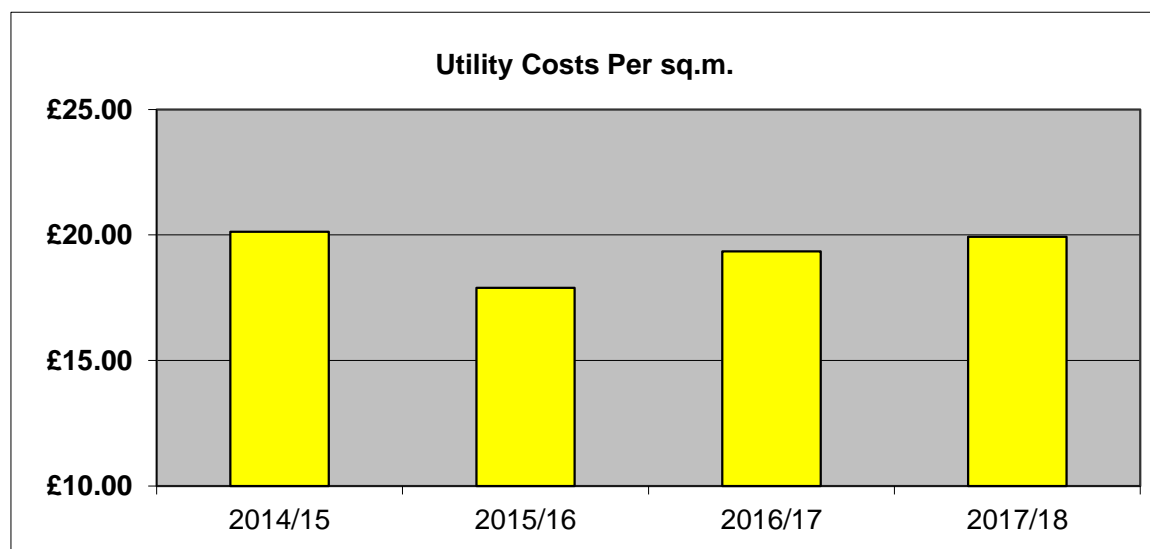


Figure 1.G.4 Graph of energy and water costs normalised by floor area for the last four years.

Note that the figures here are for all University floor space, including research, commercial, the hotel and conference centres.

## 1.H - Energy Usage and Cost per UK Student

	2014/15	2015/16	2016/17	2017/18	Change
UK Student Numbers	33,197	33,435	33,620	34,329	2.1%
Annual Energy (MWh)	203,001	199,535	200,462	207,254	3.4%
<b>Energy / Student (kWh)</b>	<b>6,115</b>	<b>5,968</b>	<b>5,963</b>	<b>6,037</b>	<b>1.3%</b>

Figure 1.H.1 Table of last four years energy usage and all student numbers.

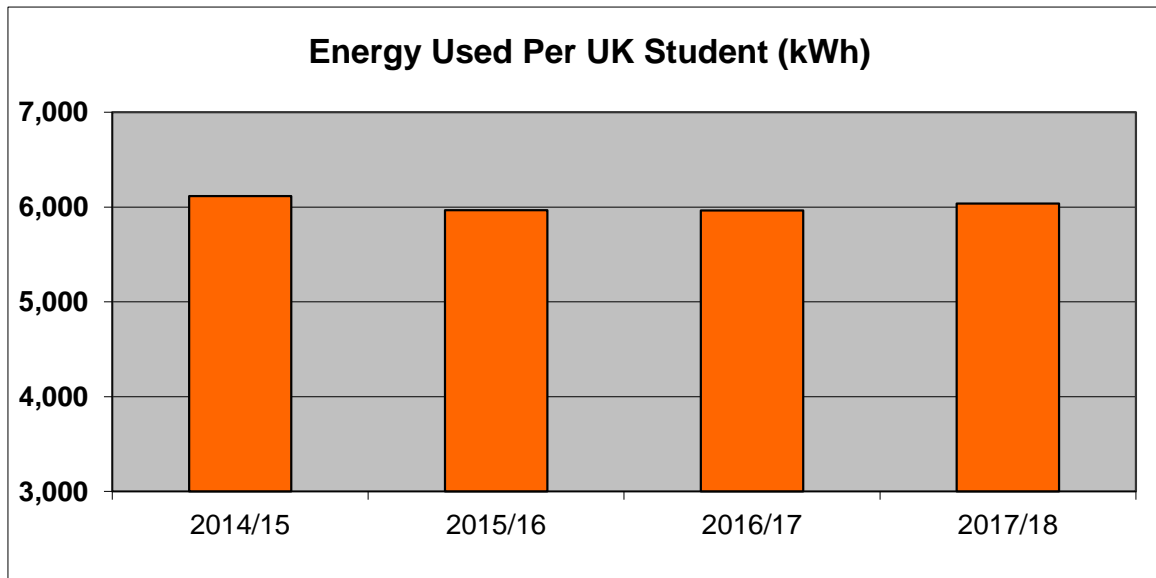


Figure 1.H.2 Graph of energy usage per UK student for the last four years.

	2014/15	2015/16	2016/17	2017/18	Change
UK Student Numbers	33,197	33,435	33,620	34,329	2.1%
Energy and Water Costs	£12,749,351	£11,955,448	£12,929,233	£13,667,475	5.7%
<b>Utility Costs / Student</b>	<b>£ 384.05</b>	<b>£ 357.57</b>	<b>£ 384.57</b>	<b>£ 398.13</b>	<b>3.5%</b>

Figure 1.H.3 Table of last four years gross energy and water costs (inc. taxes) and ft student numbers.

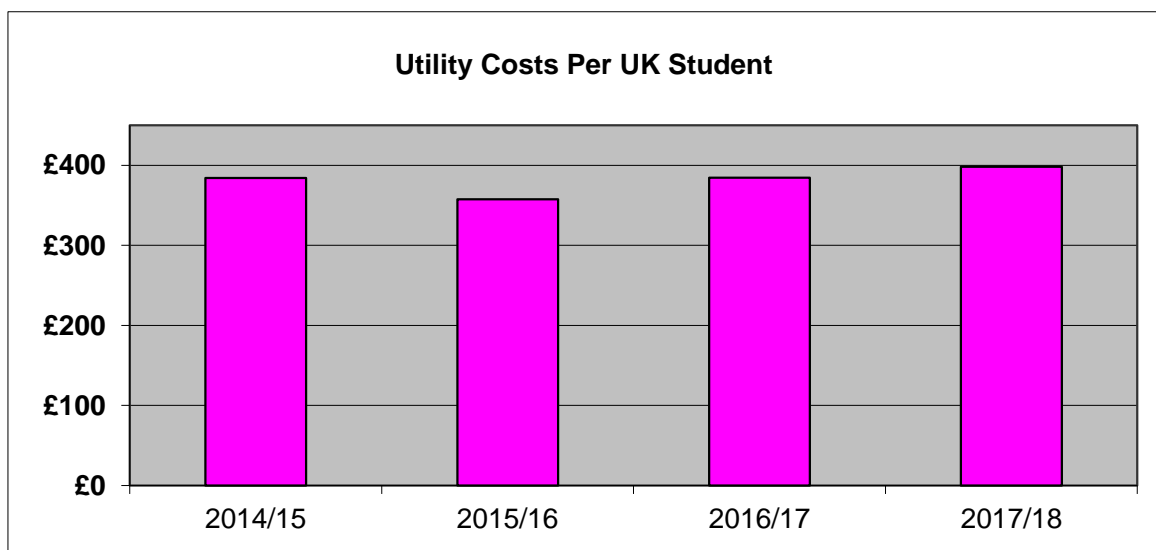


Figure 1.H.4 Graph of gross energy and water costs per UK student for the last four years.

Note: The statistics on student numbers exclude students not currently studying in Nottingham.

## 1.I - Utility Costs as a Proportion of University Expenditure

%age of Expenditure (£ 000)	2014/15	2015/16	2016/17	2017/18	Change
Utility Costs inc. taxes	£ 12,749	£ 11,955	£ 12,929	£ 13,667	5.7%
University Expenditure	£ 566,900	£ 588,600	£ 612,000	£ 612,000	0.0%
Percentage	2.25%	2.03%	2.11%	2.23%	5.7%

Figure 1.I.1 Table of last four years gross energy and water costs (including taxes) and total University expenditure.

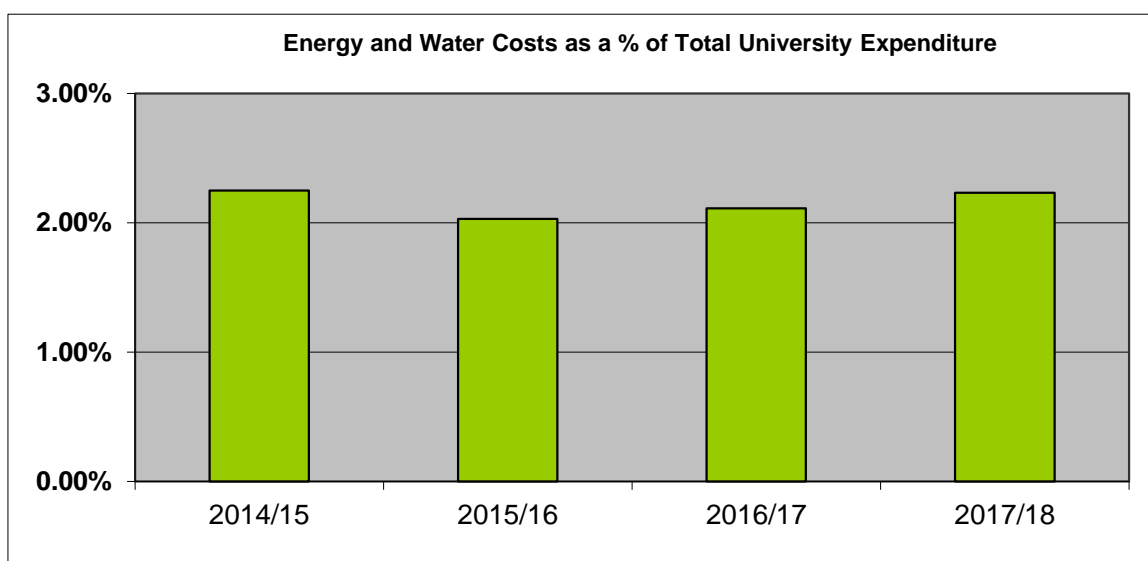


Figure 1.I.2 Graph of energy and water costs normalised by total turnover for the last four years.

## 1.J – The Carbon Reduction Commitment Energy Efficiency Scheme

Costs from the CRC Energy Efficiency Scheme are not included in the other figures in this report, because the scheme operates on an April to March year, costs are not levied on utility bills, and the Scheme operates on a slightly different subset of properties. However, the results of the sixth full year of the scheme (April 2017 to March 2018) are listed below.

Under the Scheme, our emissions were reported as 49,420 Tonnes of CO<sub>2</sub> (down 6.0% from 52,590 in the previous year). Each tonne of CO<sub>2</sub> emitted needs to be covered by an 'allowance', which costs £16.10 if pre-ordered or £17.70 if bought to comply. 135,000 allowances were pre-ordered in June 2016 at a cost of £2,173,500 in order to cover the majority of our emissions out to the scheme's end in 2018/19.

Note that the cost of 49,420 allowances (£795,662), averaged out across our total energy consumption, equates to 0.384p/kWh.

## 1.K – Energy Costs Comparison to Russell Group Universities – 2016/17

The statistics in the next four tables provide a range of comparators to other major Universities, as reported in the HESA Estate Management Return for 2016/17. Note that this is the most recent year where data is available for comparison, but runs one year behind the other information presented in this report.

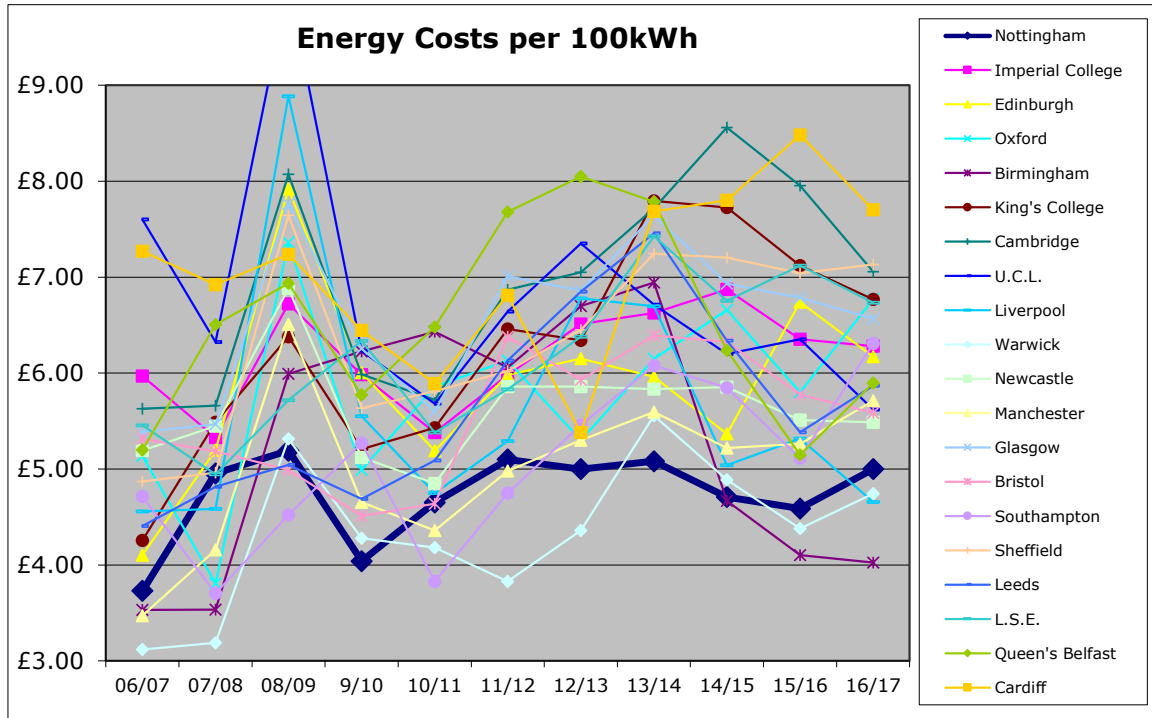


Figure 1.K.1 Graph of Russell Group Energy Costs per 100kWh.

The graph above indicates that our energy prices are now fourth lowest in the Russell Group, and the graph below shows our costs per square metre are amongst the lowest in the data set.

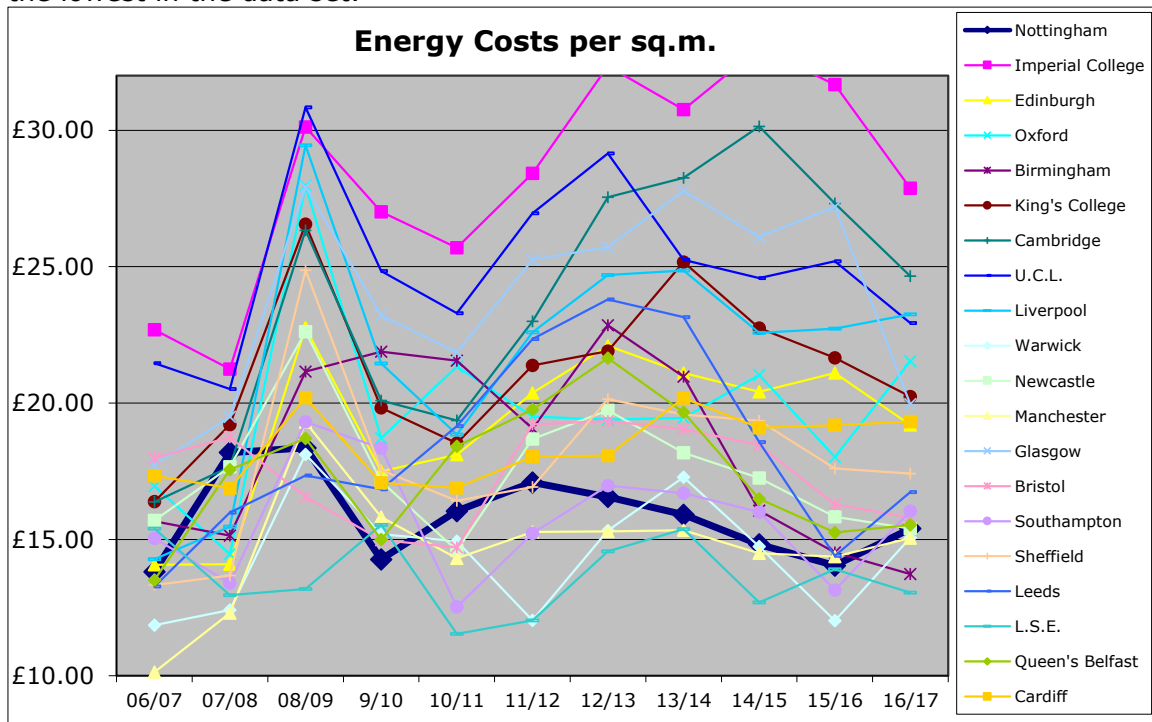


Figure 1.K.2 Graph of Russell Group Energy Costs square metre

## 1.L – Energy Efficiency Comparison to Russell Group Universities – 2016/17

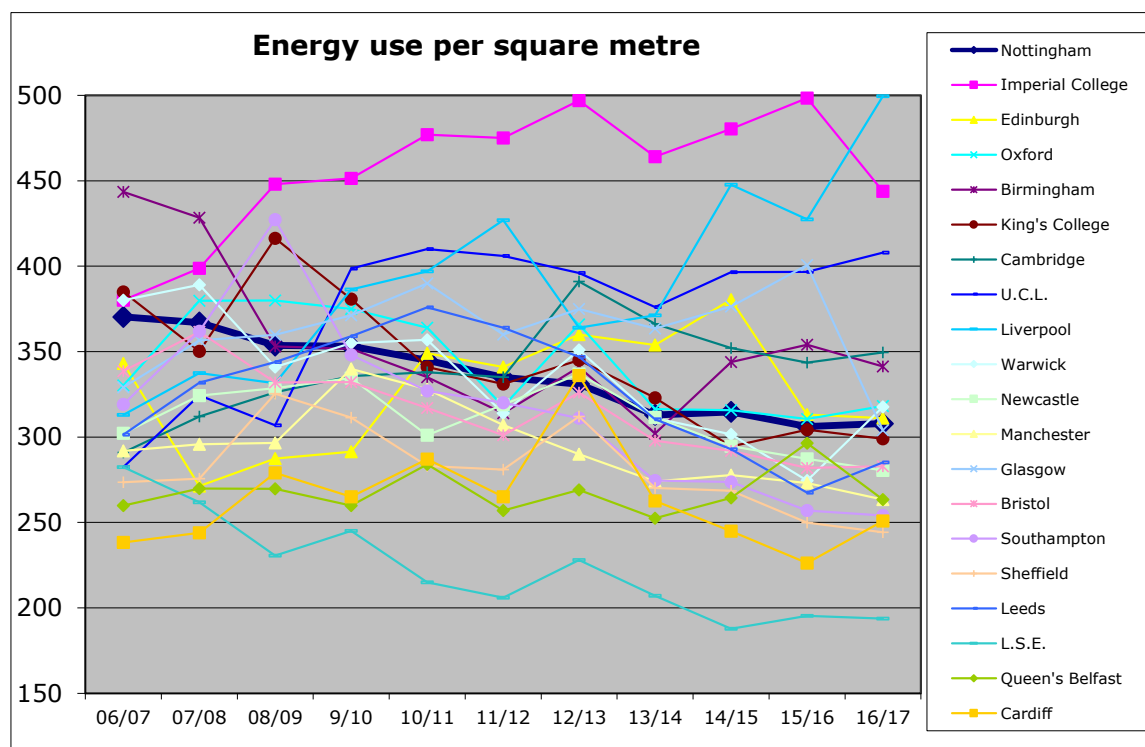


Figure 1.L.1 Graph of Russell Group Energy use per square metre.

The graphs on this page indicate that Nottingham had an energy consumption per square metre of 308kWh/m<sup>2</sup> compared to the average of 311kWh/m<sup>2</sup>, and energy use per student was 6816kWh compared to the Russell Group average of 7171kWh.

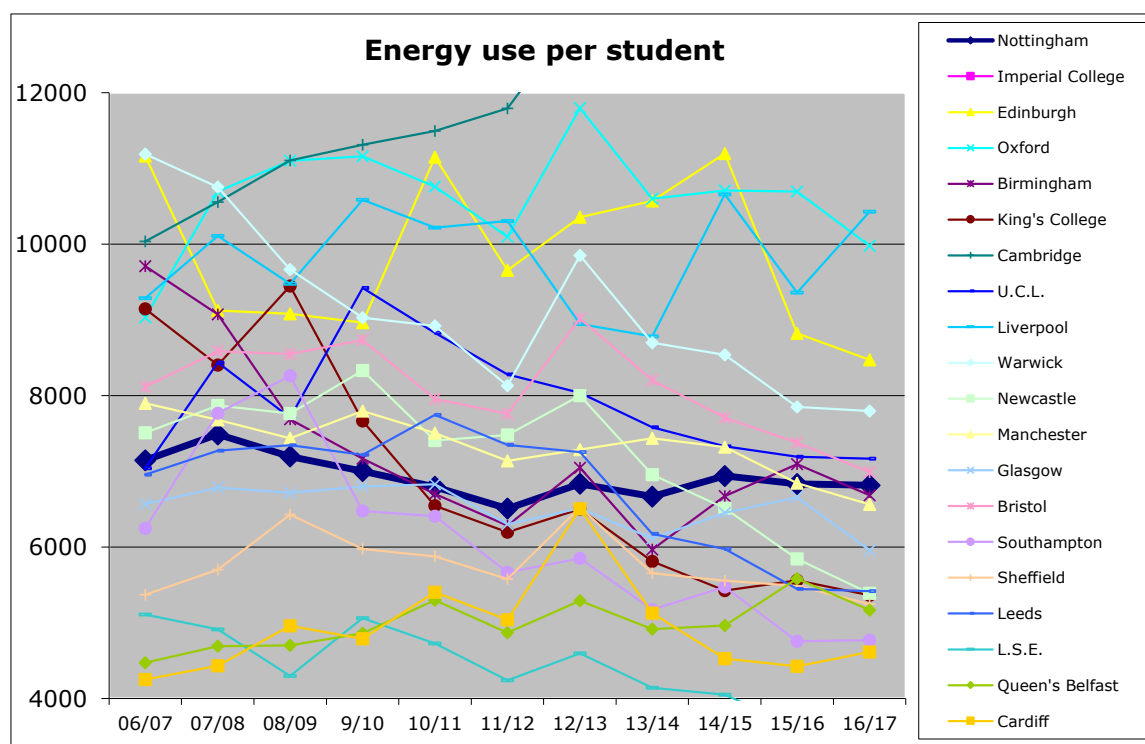


Figure 1.L.1 Graph of Russell Group Energy use per student (note Imperial is off the top of the scale at around 16,000kWh/student).



## Section 2 – Electricity, Gas and Water Consumption

### 2.A - Electricity Consumption

Electricity consumption increased by 4.9%. Some of this was due to new buildings, which added 2.6% to the size of the Estate.

Another 3% was added to overall consumption by the lower operating hours of the CHP units at Sutton Bonington. These units burn gas to produce electricity, and their reduced availability resulted in significantly more electricity having to be imported. Whilst the figures for gas usage benefitted by a corresponding amount, we did lose out overall as electricity is effectively more valuable than gas.

Removing the effects of the increased floor area and the reduced CHP availability indicates that like-for-like electricity consumption was unchanged between 2016/17 and 2017/18.

Electricity Consumption	MWh	MWh	MWh	Change
	2015/16	2016/17	2017/18	'16/17 to '17/18
University Park	46,127	47,737	48,210	1.0%
Sutton Bonington	10,099	8,699	11,180	28.5%
Jubilee Campus	8,544	10,223	12,039	17.8%
Others	4,583	5,015	4,747	-5.3%
Medical School	9,988	9,799	9,290	-5.2%
<b>Total</b>	<b>79,342</b>	<b>81,474</b>	<b>85,468</b>	<b>4.9%</b>

Figure 2.A.1 Table of electricity usage for the last 3 years split by campus.

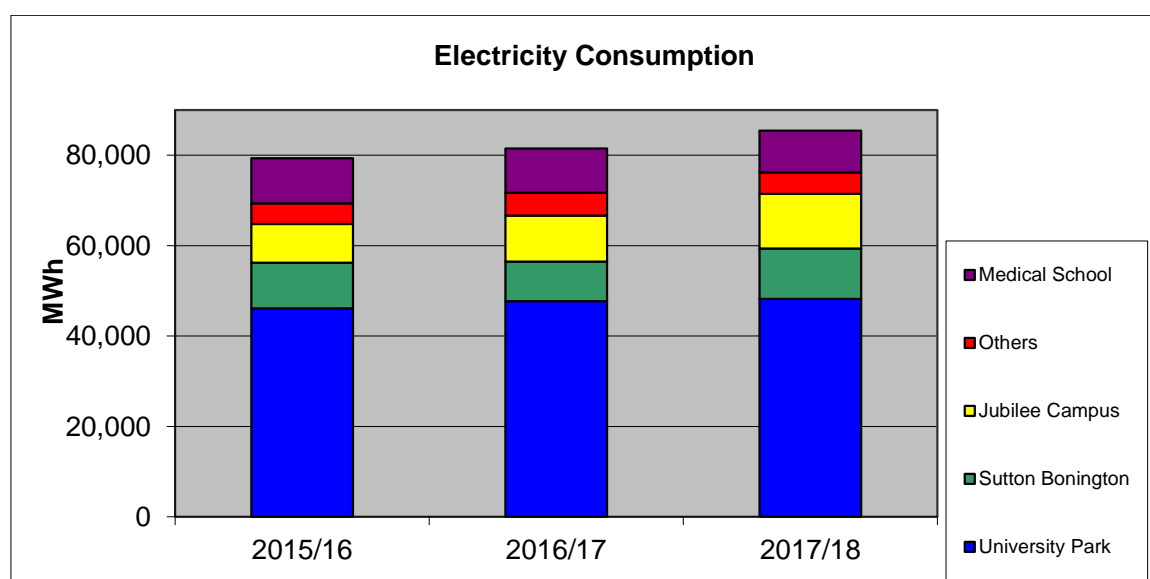


Figure 2.A.2 Graph of electricity usage for the last 3 years split by campus.

See Appendix A for a detailed breakdown of consumption on an account by account basis.

## 2.B - Electricity Costs

Annual baseload electricity prices were stable between £42 and £45p/MWh (4.2 to 4.5p/kWh) for the first six months of the year, but then started to rise sharply through April and May, finishing the year at approximately £55/MWh (5.5p/kWh). This rise in baseload electricity costs through 2017/18 of around 25% is quite significant, and has in fact continued as of September 2018, reaching £65/MWh (6.5p/kWh), a rise of around 50% in just over a year.

Despite seeing sharp rises across the year, our delivered electricity prices (including standing charges, but excluding taxes) increased from 9.31p/kWh last year to 9.54p/kWh, a rise of only 2.5%. This minimisation of costs was achieved through our purchasing strategy of using a flexible contract framework let by The Energy Consortium (TEC). This allows energy to be purchased at opportune times throughout the year, and this year most of our electricity was purchased early as 'triggers' were activated to avoid cost increases.

From April 2017 our electricity supplier for large sites under the TEC contract has been to EdF Energy. The University's 'sub-100kW' sites (representing the smaller properties) was retendered in May 2018, and the contract was won by Southern Electric.

Electricity Costs				Change
	2015/16	2016/17	2017/18	'16/17 to '17/18
University Park	£ 3,813,419	£ 4,382,301	£ 4,540,046	4%
Sutton Bonington	£ 861,973	£ 822,746	£ 1,054,461	28%
Jubilee Campus	£ 744,672	£ 979,819	£ 1,200,752	23%
Others	£ 403,326	£ 487,222	£ 469,837	-4%
Medical School	£ 614,580	£ 639,173	£ 575,620	-10%
<b>Total</b>	<b>£ 6,437,971</b>	<b>£ 7,311,262</b>	<b>£ 7,840,716</b>	<b>7%</b>

Figure 2.B.1 Table of net electricity costs (excluding taxes) for the last 3 years split by campus.

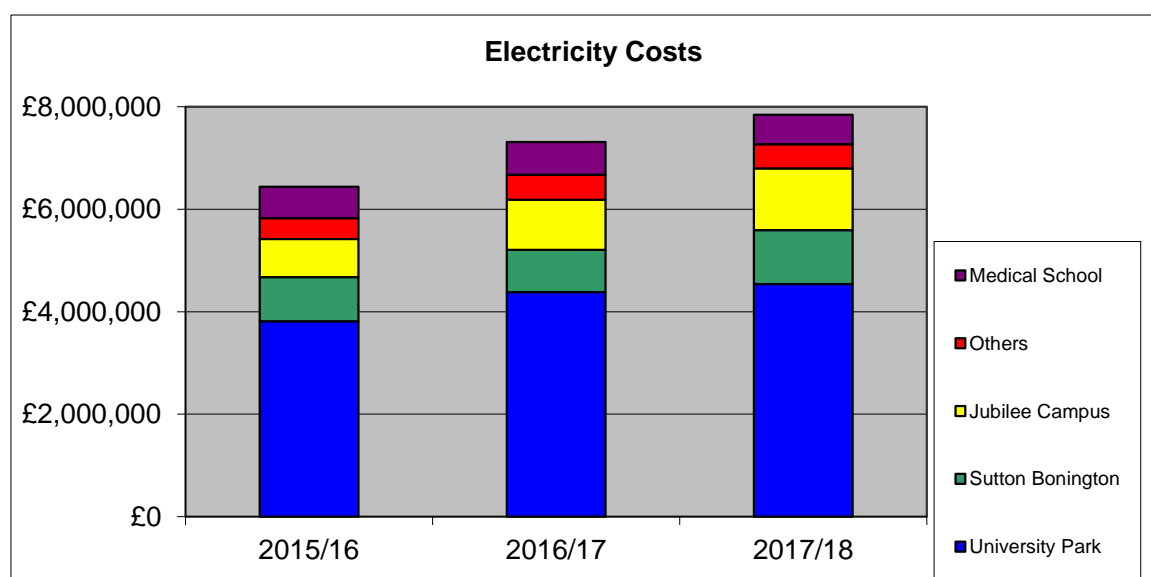


Figure 2.B.2 Graph of net electricity costs for the last 3 years split by campus.

## 2.C - Fossil Fuel (principally gas) Consumption

Our consumption of fossil fuels rose for the first time in three years, up by 2.4%. However, this was a good performance in that the colder weather alone would have predicted a 7.7% rise, and the addition of new buildings increased the total floor area of the University estate by 2.6%.

In reality the overall picture was distorted by a reduction in availability of the CHP units at the Sutton Bonington campus. These units burn gas to provide electricity plus heating. As a consequence, gas consumption at Sutton Bonington was significantly down, whilst imported electricity at the site was up by 28%.

Fossil Fuel Consumption	MWh	MWh	MWh	Change
	2015/16	2016/17	2017/18	'16/17 to '17/18
University Park	62,819	60,925	65,859	8.1%
Sutton Bonington	22,192	25,703	19,141	-25.5%
Jubilee Campus	8,599	11,086	12,285	10.8%
Others	8,350	7,791	8,902	14.3%
Medical School (Steam)	18,233	13,484	15,600	15.7%
<b>Total</b>	<b>120,193</b>	<b>118,989</b>	<b>121,787</b>	<b>2.4%</b>

Figure 2.C.1 Table of fossil fuel usage for the last 3 years split by campus.

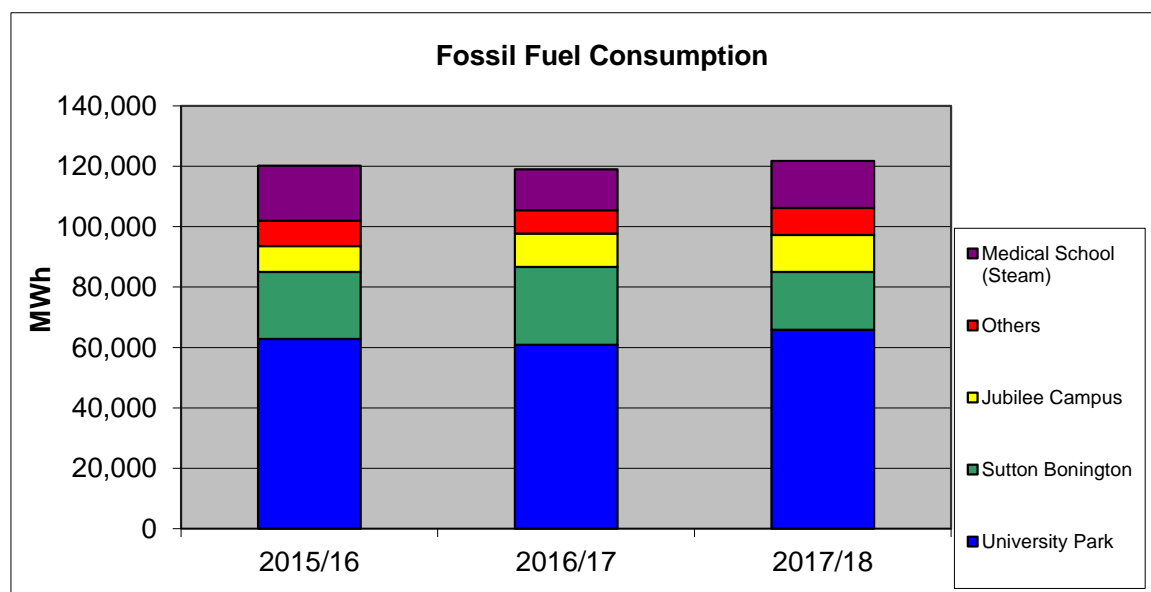


Figure 2.C.2 Graph of fossil fuel usage for the last 3 years split by campus.

See Appendix B for additional information showing a detailed breakdown of consumption on each account.

## 2.D - Fossil Fuel Costs

Annual gas prices were stable between 40 and 45p/Therm (1.36 to 1.54p/kWh) for the first six months of the year, but then started to rise sharply through April and May, finishing the year at approximately 55p/Therm (1.88p/kWh).

Delivered gas averaged across the year cost around 2.24p/kWh, a significant increase of 8.3% from last year's average of 2.07p/kWh.

Our policy of using 'flexible' energy contracts, first adopted in October 2005, allowed us to take advantage of market falls and buy when prices were low. From April 2017 our gas supplier changed to Corona Energy under a flexible contract framework let by The Energy Consortium (TEC). Most gas was bought early in the financial year by TEC as price rises activated 'triggers' in place to reduce risk and minimise our exposure to the rising price.

<b>Fossil Fuel Costs</b>				<b>Change</b>
	<b>2015/16</b>	<b>2016/17</b>	<b>2017/18</b>	<b>'16/17 to '17/18</b>
University Park	£ 1,211,403	£ 1,220,509	£ 1,360,393	11%
Sutton Bonington	£ 409,787	£ 479,328	£ 435,854	-9%
Jubilee Campus	£ 188,003	£ 314,780	£ 388,000	23%
Others	£ 166,642	£ 166,824	£ 193,819	16%
Medical School (Steam)	£ 668,417	£ 460,000	£ 426,000	-7%
<b>Total</b>	<b>£ 2,644,252</b>	<b>£ 2,641,441</b>	<b>£ 2,804,067</b>	<b>6%</b>

Figure 2.D.1 Table of net fossil fuel costs (excluding VAT and CCL) for the last 3 years split by campus.

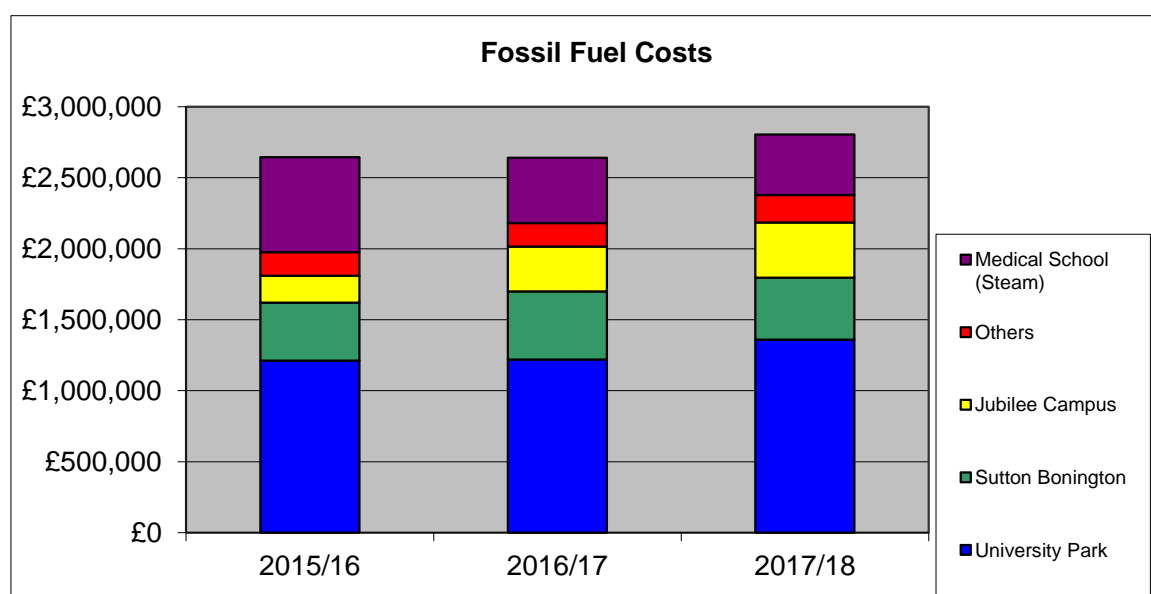


Figure 2.D.2 Graph of net fossil fuel costs for the last 3 years split by campus.

## 2.E - Water Consumption

All campuses showed reductions in water consumption compared to 16/17 as measured by the water bills issued by WaterPlus, our water supplier. However, these figures should be treated with caution as most of our larger accounts have been largely based on estimated bills for the eighteen months since WaterPlus took over from Severn Trent Water.

The large reductions at Jubilee Campus are particularly problematic, as WaterPlus have obviously been seriously underestimating the main meter for the site. One site where the data does seem reliable is the Medical School, which is recharged from the NHS Trust. Continued reductions now show that water consumption here has halved over two years, largely as a result of the introduction of the new chillers. This project allowed for the removal of the old cooling towers, which used considerable volumes of water.

Water Consumption	cubic m. 2015/16	cubic m. 2016/17	cubic m. 2017/18	Change '16/17 to '17/18
University Park	504,856	461,955	414,285	-10%
Sutton Bonington	217,745	223,538	215,650	-4%
Jubilee Campus	71,607	70,940	41,881	-41%
Others	22,246	22,006	24,226	10%
Medical School	42,670	26,900	21,500	-20%
<b>Total</b>	<b>859,124</b>	<b>805,338</b>	<b>717,542</b>	<b>-11%</b>

Figure 2.E.1 Table of water usage for the last 3 years split by campus.

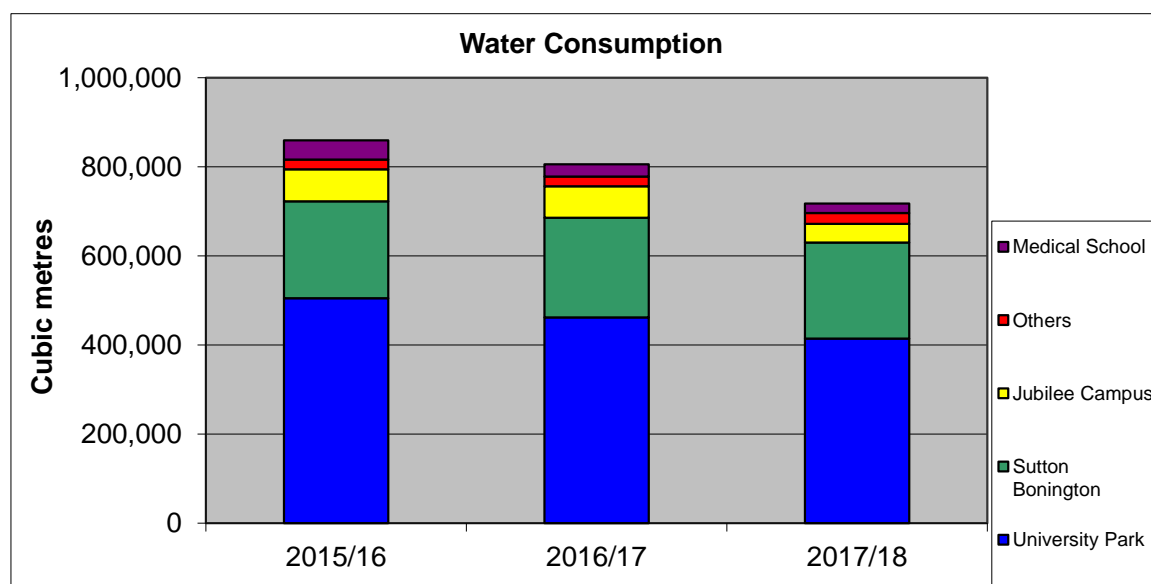


Figure 2.E.2 Graph of water usage for the last 3 years split by campus.

See Appendix C for a detailed breakdown of consumption on an account by account basis.



## 2.F - Water Costs

Since 2016 the University has purchased its water from WaterPlus, a company that is the business retail arm of Severn Trent Water in association with United Utilities.

In April 2017, prices for water were increased by 5.9%, and decreased by 9.3% for used water. These price increases affected the bulk of the year, but then prices changed again in April 2018, affecting the last three months of the financial year, with water supply up by approximately 6% and used water costs up by approximately 1.5%. The cost of surface water drainage rose by 2.9%.

Water Costs	2015/16	2016/17	2017/18	Change
				'16/17 to '17/18
University Park	£ 861,513	£ 890,000	£ 820,000	-8%
Sutton Bonington	£ 375,948	£ 386,022	£ 396,609	3%
Jubilee Campus	£ 202,990	£ 219,243	£ 170,604	-22%
Others	£ 87,636	£ 79,406	£ 89,667	13%
Medical School	£ 99,357	£ 68,000	£ 76,000	12%
<b>Total</b>	<b>£ 1,627,443</b>	<b>£ 1,642,671</b>	<b>£ 1,552,880</b>	<b>-5%</b>

Figure 2.F.1 Table of water costs for the last 3 years split by campus.

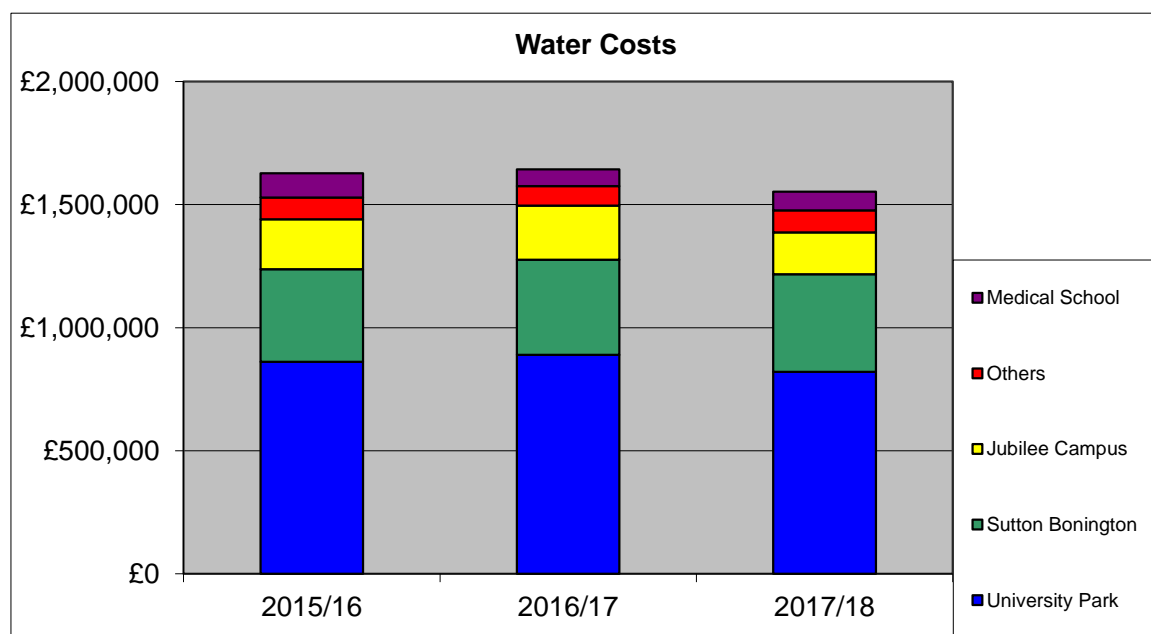


Figure 2.F.2 Graph of water costs for the last 3 years split by campus.

## Section 3 – Environmental Considerations

### 3.A - Weather Data – Degree Days

2017/18 was noticeably colder overall than the previous year, largely due to a prolonged cold snap that lasted throughout February and March. This means that a rise in fossil fuel usage of almost 8% would be expected due to the weather.

Degree days are determined by comparing the mean daily temperature to a set temperature, in this case 15.5 Celsius. For instance, a day where the outside temperature averaged 5.0C would be counted as 10.5 degree days. The values are summated over a calendar month and the total provides a reasonably accurate guide as to the relative heating load that should be required. For the purposes of this report, 75% of the change in degree days has been used, as production of domestic hot water typically accounts for about 25% of usage.

2017/18	Deg. Days 20 Yr Avg	Deg. Days 2015/16	Deg. Days 2016/17	Deg. Days 2017/18	'16/17 to '17/18 Change
Aug	32	30	22	38	72.7%
Sep	67	101	34	79	132.4%
Oct	150	145	155	106	-31.6%
Nov	257	187	295	269	-8.8%
Dec	341	178	285	338	18.6%
Jan	336	304	362	334	-7.7%
Feb	294	305	266	366	37.6%
Mar	268	306	221	342	54.8%
Apr	209	250	205	194	-5.4%
May	131	118	107	97	-9.3%
Jun	65	50	37	46	24.3%
Jul	34	26	26	13	-50.0%
<b>Total</b>	<b>2,184</b>	<b>2,000</b>	<b>2,015</b>	<b>2,222</b>	<b>10.3%</b>
				<b>Weather modifier (75%)</b>	<b>7.7%</b>

Figure 3.A.1 Table showing last 3 years monthly degree days and average degree days

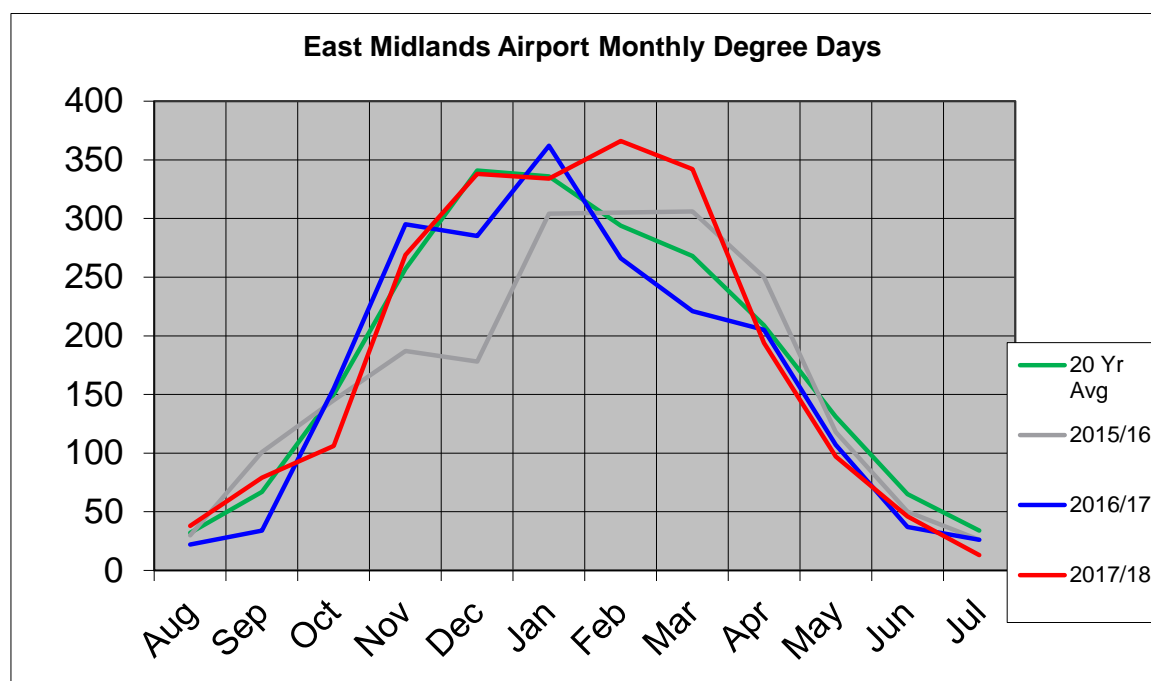


Figure 3.A.2 Graph showing last three years monthly degree days and average degree days

### 3.B – Changes since Base Year for Carbon Management Plan (2009/10)

The university adopts 2009/10 as its baseline for carbon emissions. Over the period 2009/10 to 2016/17 the University has expanded its campuses significantly through its biggest capital programme. The table below shows that new buildings constructed since 2009/10 account for 17.3% of our energy usage.

	Units	University Total '17/18	New Buildings	% due to new build
<b>2.A Electricity Consumption</b>	MWh	85,468	14,834	21.0%
<b>2.C Fossil Fuel Consumption</b>	MWh	121,787	15,675	14.8%
<b>1.E Energy Use Total</b>	MWh	207,254	30,509	17.3%
<b>2.E Water Consumption</b>	cu.m.	717,542	71,153	11.0%
<b>1.A Energy &amp; Water Costs</b>	£	£12,197,663	£1,081,391	9.7%
<b>1.G Floor Area</b>	m <sup>2</sup>	685,888	126,043	22.5%

Figure 3.B.1 Table showing effect of new buildings on key parameters.

A full breakdown of energy consumption in new buildings on a building-by-building basis is shown on the next page in Appendix 4A.

### 3.C University Renewable Energy Generation

Building	Type	Annual Production (kWh)
Dearing	PV	6,795
Business Sch North	PV	14,284
Computer Sciences	PV	6,955
Derby Hall	PV	49,403
Lincoln Hall	PV	38,537
Si Yuan Chinese Studies	PV	4,678
Aerospace Technology	PV	11,453
Energy Technologies Building	PV	11,307
Environmental Education Centre	PV	14,342
Sustainable Research Building	PV	5,124
Ingenuity Centre (TEC)	PV	4,553
Riverside Sports Pavilion A	PV	10,017
The Barn	PV	3,376
Sustainable Chemistry	PV	214,388
George Green Library	PV	33,094
Orchard Hotel	PV	7,849
Advanced Manufacturing Building	PV	3,597
Veterinary School	PV	124,295
Total		564,047
Si Yuan Chinese Studies	Solar thermal	1,724
Rutland & Sherwood Hall	Solar thermal	10,627
Geospatial	Biomass	41,686
BioEnergy	Biomass	26,891
Total		80,928

Figure 3.B.2 Table showing University renewable energy generation.

Note that the biomass production is included in the rest of the report as the fuel is ordered in externally; solar generation is effectively hidden from the rest of the report as it takes place within the relevant buildings. A true figure for energy used in buildings should add back in the solar PV and solar thermal figure.

## Section 4 – Appendices

### 4.A - Appendix A – Buildings constructed since 2009/10

New Sites		2017/18	2017/18	2017/18		2017/18	Floor Area
Main Campus		Elec kWh	Gas kWh	Water m3		Cost £	
	Engineering Science Learning Cent	1661	449,888	670,000	634	£59,283	3,511
	Humanities	1671	387,837	28,862	5,363	£49,592	4,303
(2)	Orchard Hotel	1681	1,528,033	1,469,858	16,158	£210,584	9,509
	George Green Library extn	1281	642,693	500,000	2,332	£77,539	4,377
	D. Ross Sports Village	2165	1,882,480	1,206,904	5,564	£219,238	17,018
	Teaching & Learning Building	1185	300,000	21,342	500	£33,753	6,282
	Mathematical Sciences	1561	350,088	625,000	731	£48,967	4,674
	New eco-houses		50,000	8,733	200	£5,251	526
	Totals	5,591,019	4,530,699	31,482		£704,207	50,200
New Sites		2017/18	2017/18	2017/18		2017/18	Floor Area
Sutton Bonington		Elec kWh	Gas kWh	Water m3		Cost £	
	Bio-energy and Brewing Sciences	5781	659,413	660,829	3,285	£83,451	3,493
	Bio-energy BIOMASS	5781		26,891	0	£1,354	0
	Gateway Building	5771	799,248	532,660	5,475	£101,099	3,253
	Gustafson Glasshouse		51,655	396,369	400	£16,151	400
	Future Crop Glasshouses	5445	138,077	239,736	400	£19,737	312
	The Barn	5075	337,728	430,000	2,046	£46,267	3,797
	Totals	1,986,121	2,286,484	11,606		£221,792	11,255
New Sites		2017/18	2017/18	2017/18		2017/18	Floor Area
Jubilee Campus		Elec kWh	Gas kWh	Water m3		Cost £	
(1)	6 Triumph Road	7405	0	0	0	£542	324
(1)	9 Triumph Road	7400	68,165	0	0	£21,618	399
(1)	Institute of Mental Health	7370	271,790	349,552	2,811	£40,167	3,074
	Yang Fujia (International House)	7320	400,000	524,387	1,650	£54,684	3,400
	Starbuck's Café	7305	87,910	42,674	200	£10,006	151
	The Amenities Building (Xu Yafen)	7330	420,000	188,194	3,034	£51,415	2,365
(2)	Jubilee Conference Centre	7211	1,400,000	1,543,100	0	£168,324	8,514
(1)	Ingenuity Centre (TEC Building)	7440	65,000	132,622	259	£10,927	2,292
	Nottingham Geospatial Bldg	7350	304,320	81,295	2,100	£35,968	2,944
	Geospatial BIOMASS	7350		41,686		£2,303	0
(1)	Sir Colin Campbell Building	7340	700,000	354,343	990	£76,717	4,534
	Energy Technologies Building	7360	800,000	483,291	6,041	£100,336	3,177
	Energy Technologies Bldg BIOFUEL	7360		0		£0	0
(1)	Romax Building	7390	359,717	313,033	733	£44,729	2,950
	Imperial Tobacco Site	7460	158,933	463,241	945	£64,979	0
	Woolpack House	7480	45,000	114,375	0	£8,486	1,978
	Advanced Manufacturing Building	7450	778,895	1,100,000	650	£103,691	8,880
	RAD Building	7500	200,000	300,000	400	£26,658	2,500
	GSK Sustainable Chemistry	7430	471,620	207,476	2,288	£54,577	4,540
	GSK Sustainable Chem. BIOFUEL	7430		1,224,438		£123,473	0
	Gatehouse Lodge	7470	115,000	53,025	325	£2,934	439
	Aerospace Technology Centre	7380	159,189	213,849	474	£21,757	1,934
	Si Yuan Centre for Chinese Studies	7410	132,834	101,857	200	£15,713	2,078
	Totals	6,938,373	7,832,437	23,100		£1,040,004	56,473
New Sites		2017/18	2017/18	2017/18		2017/18	Floor Area
Others		Elec kWh	Gas kWh	Water m3		Cost £	
	Clinical Sciences City Hosp Ph2	3325	80,365	117,758	51	£11,600	2,000
	Derby School of Nursing	3571	101,730	250,000	278	£15,501	1,996
	Unit 4 Easter Park	6931	0	53,025	36	£4,289	1,188
	Vaughan Parry Williams Pav.& hocl	6314	70,000	100,000	500	£9,998	823
	Riverside Grove Farm Sports	6122	66,626	504,177	4,100	£25,859	2,108
	Totals	318,721	1,024,960	4,965		£41,387	8,115
New Sites		2017/18	2017/18	2017/18		2017/18	Floor Area
Main Campus		Elec kWh	Gas kWh	Water m3		Cost £	
		5,591,019	4,530,699	31,482		704,207	50,200
	Sutton Bonington	1,986,121	2,286,484	11,606		221,792	11,255
	Jubilee Campus	6,938,373	7,832,437	23,100		1,040,004	56,473
	Others	318,721	1,024,960	4,965		41,387	8,115
	Totals	14,834,234	15,674,580	71,153		£1,081,391	126,043

On these data tables, the following notes apply:-

- (1) University of Nottingham Innovation Park assets
- (2) East Midland Conference Centre Ltd assets

## 4.B - Appendix B – Electricity Data

Electricity Invoices		2017/18	2016/17	% change	2017/18	2016/17	% change	
Main Campus		kWh	kWh	kWh	£	£	£	
Main Campus	1000	48,180,132	47,717,809	1%	£4,536,636	£4,380,091	4%	
Lenton Lodge	2251	21,000	11,200	88%	£2,100	£1,050	100%	Jul est'd
Lenton Eaves (UNSSC) (2)	1461	5,000	4,000	25%	£650	£530	23%	Jul est'd
Lenton Eaves (UNSSC) (1)	1461	3,000	3,150	-5%	£450	£440	2%	Jul est'd
Redcourt Lodge	2222	1,300	1,200	8%	£210	£190	11%	Jul est'd
Total of 5 accounts	Totals	48,210,432	47,737,359	1%	£4,540,046	£4,382,301	4%	
Electricity Invoices		2017/18	2016/17	% change	2017/18	2016/17	% change	
Sutton Bonington		kWh	kWh	kWh	£	£	£	
Sutton Bonington Campus	6800	10,769,037	8,061,065	34%	1,011,966	762,961	33%	
Centre for Dairy Science Innovation	6500	311,453	529,453	-41%	29,425	46,268	-36%	
Melton Lane Building A	5433	30,000	25,000	20%	3,100	2,300	35%	Jul est'd
St.Michael's House (Flats 1-5)	6841	15,186	20,595	-26%	1,920	2,264	-15%	
St.Michael's Close (Flats 10-15)	6840	11,300	10,893	4%	1,250	1,186	5%	Jun & Jul est'd
Bunny Park Farm	6860	8,000	7,200	11%	900	780	15%	Jul est'd
50 College Road	6819	7,003	3,838	82%	1,149	804	43%	
Eviton House (68 College Road)	5891	5,730	4,132	39%	1,068	796	34%	
24 College Road	6805	5,000	4,800	4%	670	640	5%	Jul est'd
Dairy Herdsman's House	6500	3,800	9,000	-58%	550	1,180	-53%	Jul est'd
St.Michael's Flats Nos 6&7	6842	3,800	4,400	-14%	490	640	-23%	Jul est'd
St.Michael's Flats Nos 8&9	6843	3,672	12,606	-71%	598	1,508	-60%	
44 College Road	6814	3,000	3,400	-12%	480	530	-9%	Jul est'd
40 College Road	6811	2,450	2,500	-2%	410	420	-2%	Jul est'd
45 College Road	6815	640	500	28%	200	190	5%	Jul est'd
Manor Farm Pump House Kingstons	6910	0	0	-	140	139	1%	Jul est'd
Manor Farm Soar Irrigation Pump	6910	0	0	-	144	140	3%	Jul est'd
Total of 17 accounts	Totals	11,180,071	8,699,383	29%	£1,054,461	£822,747	28%	
Electricity Invoices		2017/18	2016/17	% change	2017/18	2016/17	% change	
Jubilee Campus		kWh	kWh	kWh	£	£	£	
Jubilee Campus Main HV Supply	7000	7,958,809	6,025,096	32%	£784,521	£563,466	39%	
New HV Supply 2012, E. of Tri.Rd	7000	1,645,341	1,608,071	2%	£158,503	£151,716	4%	
(2) Jubilee Conference Centre	7211	863,422	1,030,508	-16%	£87,105	£96,608	-10%	
Newark & Southwell Halls	7000	663,245	614,460	8%	£67,423	£61,543	10%	
Jubilee Sports Centre + Starbucks	7301	480,421	456,575	5%	£51,236	£48,831	5%	
Imperial Tobacco Site	7460	158,933	238,995	-33%	£18,085	£25,987	-30%	
Gatehouse Lodge	7470	96,000	115,000	-17%	£9,300	£10,200	-9%	Jul est'd
Woolpack House	7480	97,000	80,000	21%	£12,300	£11,500	7%	Jul est'd
(1) 9 Triumph Road (ex Dairy Crest Site)		68,165	44,913	52%	£11,318	£8,907	27%	
Charnock Ave Sports Pavilion	7201	8,100	9,200	-12%	£960	£1,020	-6%	Jul est'd
(1) 6 Triumph Rd (ex Dairy Crest, opp 9 Triu		0	46	-100%	£0	£42	-100%	Demolished
Total of 11 accounts	Totals	12,039,436	10,222,864	18%	£1,200,752	£979,819	23%	
Electricity Invoices		2017/18	2016/17	% change	2017/18	2016/17	% change	
Others		kWh	kWh	kWh	£	£	£	
King's Meadow Campus	6901	2,177,030	2,447,540	-11%	£201,866	£224,448	-10%	
Derby Medical School	3561	1,264,028	1,285,296	-2%	£118,625	£120,844	-2%	
Clinical Sciences (City Hospital) Ph	3325	1,024,440	1,024,440	0%	£115,000	£109,094	5%	Costs Est'd
Clinical Sciences (City Hospital) Ph	3325	80,365	79,142	2%	£8,600	£8,428	2%	Costs Est'd
Riverside New Pavilions	6122	66,626	65,743	1%	£8,929	£8,754	2%	
Highfields Sports Ground	6311	73,180	61,100	20%	£7,408	£5,720	30%	
Highfields Hockey Pitch	6311	47,468	37,161	28%	£7,579	£8,155	-7%	
Boat House	6321	5,200	5,400	-4%	£650	£640	2%	Jul est'd
Grove Farm - Old Farmhouse	6121	5,200	5,200	0%	£650	£630	3%	Jul est'd
Grove Farm (Groundsman's Store)	6123	3,900	3,900	0%	£530	£510	4%	Jul est'd
Total of 10 accounts	Totals	4,747,437	5,014,922	-5%	£469,837	£487,223	-4%	
Electricity Invoices		2017/18	2016/17	% change	2017/18	2016/17	% change	
Medical School		kWh	kWh	kWh	£	£	£	
Medical School		6,931,743	7,123,163	-3%	£522,000	£580,000	-10%	Apr-Jul costs est'd
Embedded units (Q.M.C.)		1,900,000	2,200,000	-14%	£0	£0	-	Apr-Jul costs est'd
New chillers supply, 2016		458,396	475,923	-4%	£53,620	£59,173	-9%	
Totals	Totals	9,290,139	9,799,086	-5%	£575,620	£639,173	-10%	



## 4.C - Appendix C – Fossil Fuel Data

	Gas Invoices		2017/18	2016/17	% change	2017/18	2016/17	% change	
	Main Campus		kWh	kWh	kWh	£	£	£	
	Central Heating Station	1000	29,373,660	26,656,656	10%	£558,499	£498,537	12%	
	Rutland Hall & Sherwood Hall	2191	2,750,721	2,500,572	10%	£55,514	£50,068	11%	
	Hugh Stewart Hall	1353	2,304,578	2,001,165	15%	£48,186	£41,690	16%	
	Swimming Pool	2171	1,989,211	1,841,395	8%	£40,248	£36,363	11%	
	Cripps Hall	2181	1,977,336	2,042,182	-3%	£41,913	£41,804	0%	
	Derby Hall	2121	1,937,083	1,845,888	5%	£39,443	£36,350	9%	
	Bio-Molecular Sciences Phase 2	1571	1,900,934	2,087,283	-9%	£40,636	£40,496	0%	
	Bio-Molecular Sciences Phase 1	1353	1,787,136	1,425,689	25%	£36,961	£29,352	26%	
(2)	Jesse Boot Conference Centre	1481	1,503,460	1,401,144	7%	£32,874	£28,182	17%	Operated by De Vere
	Willoughby Hall	1681	1,488,318	1,224,087	22%	£30,395	£25,391	20%	
(2)	Orchard Hotel	2141	1,469,858	1,359,070	8%	£29,886	£26,675	12%	Operated by De Vere
	Lenton & Wortley Hall	2211	1,220,000	1,305,274	-7%	£24,500	£28,055	-13%	Jul est'd
	David Ross Sports Village	2150	1,206,904	948,733	27%	£27,663	£21,503	29%	
	Tower	1271	1,198,806	1,099,920	9%	£25,287	£23,135	9%	
	Lincoln Hall	2161	1,189,799	1,189,822	0%	£25,934	£25,297	3%	
	Nightingale Hall	2131	1,147,950	1,086,265	6%	£24,737	£23,099	7%	
	Florence Boot Hall	1221	1,125,843	1,029,275	9%	£24,148	£21,913	10%	
	Cavendish Hall	2111	890,389	913,455	-3%	£19,544	£18,797	4%	
	Ancaster Hall	1581	888,501	813,825	9%	£19,422	£17,649	10%	
	Boots Science Building	2101	806,601	869,237	-7%	£18,083	£17,308	4%	
	Trent Building	1501	676,547	554,623	22%	£14,487	£13,406	8%	
	Institute of Hearing Research	1401	554,803	558,792	-1%	£12,340	£11,054	12%	
	Portland Building	1101	540,844	528,904	2%	£11,747	£10,294	14%	
	Arts Centre & School of Music	1111	528,146	589,425	-10%	£12,024	£12,569	-4%	
	Hemsley (Staff Club) Lenton Mour	1631	493,558	371,210	33%	£10,721	£8,031	33%	
	Lenton Firs - Built Environment	1431	472,000	417,425	13%	£11,400	£10,220	12%	Jul est'd
	D.H.Lawrence Lakeside Pavilion	1421	463,241	451,903	3%	£10,649	£9,887	8%	
	Wolfson Building	1181	416,246	371,569	12%	£10,790	£8,817	22%	
	Innovative Technology Research C	1641	308,506	339,984	-9%	£7,819	£7,307	7%	
	Redcourt	2221	269,052	244,342	10%	£6,507	£5,530	18%	
	Lenton Hurst	1111	258,509	215,395	20%	£6,414	£4,916	30%	
	Cripps Health Centre	2411	245,098	209,036	17%	£5,946	£4,779	24%	
	Portland Building	1439	222,973	239,090	-7%	£5,873	£5,624	4%	
	Lenton Grove (History)	1231	156,684	174,274	-10%	£4,116	£4,086	1%	
	Manufacturing Engineering (MMME)	1371	149,505	201,000	-26%	£4,268	£4,300	-1%	Jul est'd
	Environmental Education Centre (I	1211	134,048	211,740	-37%	£3,744	£4,553	-18%	
	Paton House (Built Env.)	1461	133,657	90,941	47%	£3,439	£2,278	51%	
	Lenton Fields Play Centre (China H	2163	124,356	116,694	7%	£3,462	£2,945	18%	
	Lenton Eaves (UNSSC)	2171	118,949	124,905	-5%	£3,319	£3,091	7%	Jul est'd
	Rutland Hall Extension	2195	115,668	100,335	15%	£2,904	£2,407	21%	
	Lenton Close Annexe (Cripps Hall)	2175	115,009	97,963	17%	£2,905	£2,174	34%	
	Cavendish Hall Extension 1994 (H	1436	113,464	91,300	24%	£2,864	£2,257	27%	
	Cripps Hall kitchen	2115	112,398	102,000	10%	£3,046	£2,500	22%	
	Sustainable Research Building	1441	97,335	97,219	0%	£2,756	£2,490	11%	
	Orchards	1161	90,760	90,274	1%	£2,641	£2,412	10%	
	Paton Cottage (Stables Annx, Pat	2200	85,848	34,567	148%	£2,182	£990	120%	
	Sherwood Hall kitchen	2251	66,906	77,188	-13%	£1,983	£1,939	2%	
	Lincoln Hall kitchen	2150	65,973	66,444	-1%	£2,099	£1,856	13%	
	Rutland Hall kitchen	1223	56,071	41,611	35%	£1,727	£1,295	33%	
	Warden's House Sherwood Hall	2207	51,931	50,410	3%	£1,637	£1,364	20%	
	Centre for 3D Design	1482	51,063	55,696	-8%	£1,712	£1,446	18%	
(2)	J.Boot C.C. Annexe (Cottage)	2191	51,058	45,404	12%	£1,604	£1,260	27%	
	Former Warden's House, Cavendish	1442	44,647	31,122	43%	£1,326	£911	46%	
	Cavendish Hall kitchen	2133	39,375	30,412	29%	£1,288	£920	40%	
	Warden's House Ancaster Hall	2113	33,374	15,328	118%	£931	£529	76%	
	Warden's House Rutland Hall	2111	31,361	28,166	11%	£1,108	£881	26%	
	Warden's House Florence Boot Ha	2194	31,241	31,685	-1%	£1,120	£926	21%	
	Lenton & Wortley Hall kitchen	2241	30,782	24,403	26%	£1,483	£1,185	25%	
	Humanities	2141	28,862	14,756	96%	£997	£618	61%	
	Lenton Firs Lodge West	2296	26,534	28,159	-6%	£1,041	£880	18%	
	Lenton Lodge	2105	23,193	69,215	-66%	£1,264	£1,888	-33%	
	5A Wortley Hall Close (Eco-House	1671	23,162	21,479	8%	£904	£684	32%	
	Teaching & Learning Hub	1185	21,342	0	-	£4,080	£0	-	
	Redcourt Lodge	2222	11,502	9,796	17%	£641	£394	62%	
	Green Close (New Eco-houses)		8,733	11,410	-23%	£700	£554	26%	
	Sherwood Hall Laundry	2200	7,873	6,858	15%	£512	£400	28%	
	Total of 65 accounts	Totals	65,859,271	60,925,388	8%	£1,360,393	£1,220,508	11%	

#### 4.C - Appendix C – Fossil Fuel Data continued

Gas Invoices		2017/18	2016/17	% change	2017/18	2016/17	% change		
Sutton Bonington		kWh	kWh	kWh	£	£	£		
	Main Boilerhouse	6800	12,190,650	18,983,000	-36%	£268,600	£325,000	-17%	
	Plant Sciences	5711	2,074,855	2,010,568	3%	£46,352	£41,279	12%	
	Veterinary School	5721	1,989,138	1,999,842	-1%	£42,463	£40,064	6%	
	Bio-Energy and Brewing Science	5781	660,829	521,804	27%	£13,453	£10,031	34%	
	Gateway Building (Bio-Sciences)	5771	532,660	497,106	7%	£13,025	£10,788	21%	
	Gustafson Glasshouse		396,369	413,488	-4%	£10,359	£10,169	2%	
	Sports Centre SB	5951	272,254	210,985	29%	£7,170	£5,381	33%	
	TCRU Future Crop Glasshouses	5445	239,736	174,574	37%	£5,703	£4,519	26%	
	The Elms (Environmental Science)	5161	150,862	139,491	8%	£3,879	£3,256	19%	
	The Firs (Surgery No.2)	5233	141,129	106,952	32%	£4,346	£3,171	37%	
	Eviton House (68 College Road)	5891	121,979	132,205	-8%	£3,250	£3,071	6%	
	Food Science Building HWS	5701	73,547	51,464	43%	£1,966	£1,376	43%	
	'Farm' Boilerhouse	6800	45,117	38,096	18%	£1,780	£2,892	-38%	
	St.Michael's House Flat 1	6841	42,034	33,329	26%	£1,333	£897	49%	
	Bio-Energy BIOMASS	5781	26,891	170,989	-84%	£1,354	£7,409	-82%	Deliveries
	Bonington Hall Warden's House	5842	25,781	25,146	3%	£1,000	£792	26%	
	Food Hall / Shop	5081	25,570	25,349	1%	£1,354	£1,030	32%	
	Bonington Hall Laundry & Gym	5881	25,459	24,335	5%	£989	£835	18%	
	52 College Road	6820	21,297	18,441	15%	£865	£667	30%	
	St.Michael's Flats Nos 6&7	6842	20,438	42,952	-52%	£1,034	£1,196	-14%	
	St.Michael's House Flat 2	6841	20,348	21,757	-6%	£863	£691	25%	
	St.Michael's House Flat 5	6841	18,926	13,042	45%	£762	£494	54%	
	24 College Road	6805	12,223	18,562	-34%	£633	£810	-22%	
	St.Michael's House Flat 4	6841	9,546	10,685	-11%	£718	£568	26%	
	St.Michael's Flats Nos 8&9	6843	2,965	4,110	-28%	£504	£328	54%	
	North Laboratory	5091	191	223	-14%	£352	£270	31%	
	South Laboratory	5051	134	124	8%	£328	£254	29%	
	Main Building (Sutton Bonington)	5011	0	0	-	£728	£1,306	-44%	
	Sports Hall Sutton Bonington (Old)	5221	0	0	-	£301	£262	15%	
	St.Michael's House Flat 3	6841	-278	14,380	-	£391	£522	-25%	
Total of 30 accounts		Totals	19,140,651	25,702,999	-26%	£435,854	£479,328	-9%	
Gas Invoices		2017/18	2016/17	% change	2017/18	2016/17	% change		
Jubilee Campus		kWh	kWh	kWh	£	£	£		
(2)	Jubilee Conference Centre (NCSL)	7211	1,543,100	1,431,869	8%	£34,804	£30,570	14%	
	GSK Centre for Sustainable Chemi	7430	1,224,438	907,786	35%	£123,473	£84,664	46%	Deliveries
	Newark Hall	7130	1,032,071	1,214,789	-15%	£25,256	£25,389	-1%	
	The Exchange (CTF)	7030	798,093	664,299	20%	£18,542	£14,680	26%	
	Computer Sciences (DCS) & The A	7040	676,561	786,578	-14%	£16,338	£17,221	-5%	
	Southwell Hall	7120	645,390	599,803	8%	£14,433	£12,761	13%	
	Melton Hall	7110	605,056	517,287	17%	£14,212	£11,383	25%	
	Business School South (New)	7080	552,429	580,541	-5%	£13,337	£12,367	8%	
	YANG Fujia Building (International)	7320	524,387	464,384	13%	£12,965	£10,162	28%	
	Dearing Building (FOE)	7050	508,708	457,997	11%	£12,254	£10,583	16%	
	Energy Technologies Building	7360	483,291	551,700	-12%	£10,965	£11,327	-3%	
	Bonded Warehouses (Imperial Tot	7460	463,241	143,528	223%	£9,772	£3,551	175%	
	Business School North (SMF)	7020	411,389	400,652	3%	£10,093	£9,220	9%	
(1)	Jubilee Sports Centre	7301	372,690	324,554	15%	£9,024	£7,913	14%	
	Sir Colin Campbell Building + GSK	7340	354,343	381,662	-7%	£7,815	£7,472	5%	
(1)	Institute of Mental Health	7370	349,552	277,466	26%	£8,163	£6,263	30%	
(1)	Computer Sciences (DCS) & The A	7040	332,178	228,291	46%	£7,678	£6,741	14%	
	Romax Building	7390	313,033	320,961	-2%	£8,836	£7,470	18%	
	Aerospace Technology Centre	7380	213,849	277,466	-23%	£5,550	£6,105	-9%	
	Xu Yafen (The Amenities Building)	7330	188,194	156,057	21%	£4,793	£4,302	11%	
	Ingenuity Centre (TEC Building)	7440	132,622	125,100	6%	£4,168	£5,202	-20%	
	Sir Colin Campbell Building	7340	125,424	0	-	£2,984	£328	810%	
	Woolpack House (ex Romserve /	7480	114,375	0	-	£2,586	£426	507%	
	Si Yuan Centre For Chinese Studie	7410	101,857	50,135	103%	£2,611	£1,367	91%	
	The Nottingham Geospatial Buildin	7350	81,295	84,907	-4%	£2,400	£2,194	9%	
	Gatehouse Lodge	7470	53,025	35,098	51%	£1,456	£907	60%	
	Starbucks Cafe Jubilee		42,674	28,134	52%	£1,189	£818	45%	
	Geospatial BIOMASS	7350	41,686	74,654	-	£2,303	£3,395	-	Deliveries
(1)	Energy Technologies Bldg BIOFUEL	7360	0	0	-	£0	£0	-	Deliveries
Total of 29 items			12,284,949	11,085,696	11%	£388,000	£314,779	23%	
Gas Invoices		2017/18	2016/17	% change	2017/18	2016/17	% change		
Others		kWh	kWh	kWh	£	£	£		
	King's Meadow Campus	6901	5,504,388	4,683,394	18%	£113,957	£97,752	17%	
	Derby Medical School	3561	1,785,567	1,663,458	7%	£40,246	£34,404	17%	
	Clinical Sciences (City Hospital) Ph	3325	655,408	676,603	-3%	£16,000	£16,000	0%	
	Grove Farm - Changing Rooms	6122	504,177	344,155	46%	£10,630	£6,937	53%	
	Highfields Sports Ground	6311	147,273	145,790	1%	£3,923	£3,562	10%	
	Clinical Sciences (City Hospital) Ph	3325	117,758	130,115	-9%	£2,800	£3,000	-7%	
	Vaughan Parry Williams Pavilion	6314	89,793	82,440	9%	£2,793	£2,380	17%	
	Unit 4, Easter Park	6931	53,025	21,742	144%	£1,781	£954	87%	
	Grove Farm OIL		22,374	33,241	-33%	£840	£1,481	-43%	Deliveries
	Boathouse KEROSENE		22,140	9,988	122%	£849	£355	139%	Deliveries
Total of 10 accounts			8,901,904	7,790,926	14%	£193,819	£166,824	16%	
Steam Used		2017/18	2016/17	% change	2017/18	2016/17	% change		
Medical School		kWh	kWh	kWh	£	£	£		
	Medical School		10,700,000	9,783,510	9%	£426,000	£460,000	-7%	Apr-Jul est'd
	Embedded Units (Q.M.C.)		4,900,000	3,700,000	32%	£0	£0	-	Apr-Jul est'd
			15,600,000	13,483,510	16%	£426,000	£460,000	-7%	

## 4.D - Appendix D – Water Data

Water Invoices		2017/18	2016/17	% change	2017/18	2016/17	% change		
Main Campus		cubic m.	cubic m.	cubic m.	£	£	£		
	Main meter, South entrance	1000	388,000	443,000	-12%	£0	£0	-	Jul estd
(2)	Orchard Hotel	1681	16,000	7,000	129%	£0	£0	-	Jul estd
(2)	JBCC Banqueting Rooms	1481	3,800	300	1167%	£0	£0	-	Jul estd
	Nightingale Hall	2161	1,600	6,500	-75%	£0	£0	-	Jul estd
	Paton House (Built Env.)	1441	1,000	450	122%	£0	£0	-	Jul estd
(2)	Jesse Boot Conference Centre	1481	900	1,200	-25%	£0	£0	-	Jul estd
	Lenton Eaves (UNSSC)	1461	850	950	-11%	£0	£0	-	Jul estd
	Lenton Grove (History)	1211	610	590	3%	£0	£0	-	Jul estd
	Lenton Hurst	2411	540	500	8%	£0	£0	-	Jul estd
	Redcourt	2221	530	420	26%	£0	£0	-	Jul estd
	Lenton Firs - Built Environment	1431	380	380	0%	£0	£0	-	Jul estd
	5A Wortley Hall Close (Eco-House)	2296	75	65	15%	£0	£0	-	Jul estd
	Lenton Lodge	2251	0	600	-100%	£0	£0	-	Jul estd
	Water & SWD charges	1000	0	0	-	£330,000	£440,000	-25%	Jul estd
	TE & sewerage charges	1000	0	0	-	£490,000	£450,000	9%	Apr - Jul estd
Total of 15 accounts		Totals	414,285	461,955	-10%	£820,000	£890,000	-8%	
Water Invoices		2017/18	2016/17	% change	2017/18	2016/17	% change		
Sutton Bonington		cubic m.	cubic m.	cubic m.	£	£	£		
	Landcroft Lane meter	6800	213,000	202,000	5%	£0	£0	-	Est'd
	St.Michael's House (Flats 1-5)	6841	2,500	2,188	14%	£6,300	£5,536	14%	Mar-Jul estd
	Bunny Park Farm	6860	150	350	-57%	£260	£435	-40%	May-Jul estd
	College Road meter	6800	0	19,000	-100%	£0	£0	-	Est'd
	Trough, Kegworth Road	6910	0	0	-	£49	£50	-2%	
	SB water charges	6800	0	0	-	£200,000	£195,000	3%	Est'd
	SB TE & sewerage charges	6800	0	0	-	£190,000	£185,000	3%	Est'd
Total of 7 items			215,650	223,538	-4%	£396,609	£386,022	3%	
Water Invoices		2017/18	2016/17	% change	2017/18	2016/17	% change		
Jubilee Campus		cubic m.	cubic m.	cubic m.	£	£	£		
(1)	Jubilee Campus ETB/IMH/ATC/Ror	7000	12,252	14,612	-16%	£0	£0	-	
	Southwell Hall	7120	8,369	7,504	12%	£0	£0	-	
	Jubilee Campus main meter	7000	7,808	34,956	-78%	£0	£0	-	Meter not recording
	Xu Yafen (The Amenities Building)	7330	3,034	2,893	5%	£0	£0	-	
	Jubilee Sports Centre	7301	2,741	3,373	-19%	£0	£0	-	
	Newark Hall	7130	2,167	1,181	83%	£0	£0	-	
	YANG Fujia Building (International	7320	1,650	1,295	27%	£0	£0	-	
	Sir Colin Campbell Building (Gatew	7340	990	1,110	-11%	£0	£0	-	
(1)	9 Triumph Road (ex Dairy Crest Site)		920	410	124%	£0	£0	-	Jul est'd
	Bonded Warehouses (Imperial Tot	7460	835	604	38%	£17,600	£18,958	-7%	Jul est'd
	Advanced Manufacturing Building	7450	660	0	-	£1,700	£0	-	Jul est'd
	Gatehouse Lodge	7470	220	700	-69%	£820	£548	50%	May-Jul est'd
	Gatehouse Lodge	7470	125	0	-	£578	£0	-	
	Bonded Warehouses (Imperial Tot	7460	110	113	-2%	£335	£329	2%	
	The Nottingham Geospatial Buildin	7350	0	2,169	-100%	£0	£0	-	Meter not recording
(1)	6 Triumph Rd (ex Dairy Crest, opp		0	20	-100%	£500	£570	-12%	Feb-Jul est'd
(1)	Charnock Ave Sports Pavilion	7201	0	1	-100%	£71	£80	-11%	May-Jul est'd
(1)	9 Triumph Road (ex Dairy Crest Site)		0	0	-	£10,300	£9,500	8%	Jul est'd
	Jubilee Campus costs inc. SWD	7000	0	0	-	£138,700	£189,257	-27%	
Total of 17 items			41,881	70,940	-41%	£170,604	£219,243	-22%	
Water Invoices		2017/18	2016/17	% change	2017/18	2016/17	% change		
Others		cubic m.	cubic m.	cubic m.	£	£	£		
	King's Meadow Campus	6901	10,693	9,668	11%	£50,432	£43,000	17%	Costs estd Apr-Jul
	Clinical Sciences (City Hospital) Ph	3325	6,238	6,056	3%	£23,000	£22,000	5%	Costs estd
	Grove Farm - Changing Rooms	6122	4,100	3,700	11%	£6,300	£5,800	9%	Jul estd
	Boat House	6321	2,000	1,768	13%	£4,900	£4,419	11%	
	Highfields Sports Ground	6311	1,142	727	57%	£2,955	£1,888	56%	
	Unit 4, Easter Park	6931	35	36	-4%	£2,000	£2,119	-6%	
	Clinical Sciences (City Hospital) Ph	3325	18	51	-65%	£80	£180	-56%	Costs estd
			24,226	22,006	10%	£89,667	£79,406	13%	
Water Recharges		2017/18	2016/17	% change	2017/18	2016/17	% change		
Medical School		cubic m.	cubic m.	cubic m.	£	£	£		
	Medical School		18,000	24,000	-25%	£48,000	£44,000	9%	Apr-Jul est'd
	Embedded Units		3,500	2,900	21%	£28,000	£24,000	17%	Apr-Jul est'd
			21,500	26,900	-20%	£76,000	£68,000	12%	



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