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Annual Energy Report 2016/17

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ANNUAL ENERGY REPORT 2016/17

Short Summary



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Nottingham
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THERE WAS A REDUCTION IN LIKE FOR LIKE ENERGY USE OF 3.2% IN 2016/17.

Four new buildings were added to the estate in 2016/17 - the David Ross Sports Village, the GSK Centre for Sustainable Chemistry, the Jubilee Conference Centre and the Ingenuity Building. Removing the energy usage of the four new buildings shows electricity usage was down by 1.2% and gas down by 4.5%.



Sutton Bonington CHP

Energy costs increased by 8% to £11.6m

In 2016/17 the costs of gas increased by 7% and electricity by 11%. We were able to minimise the increases

by buying at opportune times through our flexible procurement contract now let through The Energy Consortium (TEC). From April 2017 we entered new contracts and our electricity is now supplied by EDF Energy and gas by Corona Energy.

PV production was up by 73% year on year

This was largely due to the new GSK Centre for Sustainable Chemistry, which added 205,000kWh to our overall renewable energy production of 757,000kWh.

Our water consumption was down by 6%.

All sites except Sutton Bonington showed reductions, with the Medical School down by 37%.

Total energy consumption was up by 0.5%

Gas consumption was down 1.0%, electricity consumption was up 2.7%.



The Ingenuity Building

The size of the University's estate grew by 4.1%

Four new buildings were added to the Estate - The David Ross Sports Village, the GSK Centre for Sustainable Chemistry, The Jubilee Conference Centre and the Ingenuity Building. These buildings added 3.9% to electricity consumption and 2.9% to gas.

Energy Consumption grew at Jubilee Campus by 20%.

This was on account of three of the four new buildings being sited here. Energy Consumption reduced by 34% at the Medical School over the last two years as a result of capital investments in new chillers and fabric improvements.

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2016/17 Energy Report

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Executive Summary

Energy prices were up quite significantly this year, with price rises of 7% on gas and 11% on electricity – due to market energy price rises and rising environmental taxes. However, our flexible purchasing strategy allowed us to contain our costs to an overall rise of 8%. Although actual energy usage was up slightly – a rise of 0.5% – four major new buildings were included this year, and a like-for-like comparison shows a reduction of 3.2% was achieved. This was primarily due to continued savings showing from energy-saving projects at the Medical School and Sutton Bonington.

Key statistics:-

Energy and water costs, excluding taxes, increased by 8% to £11.6m in 2016/17

Energy consumption was up by 0.5%. Gas was down 1.0% and electricity up 2.7%.

Water usage decreased by 6%.

Other observations:-

Utility costs/m² up 3.9% to £19.35

Energy consumption/m² down 3.5% to 300kWh/m²

Energy costs/student up 7.6% to £358

Energy consumption/student down 0.1% to 5,963kWh

External factors:-

The University continues to grow and floor area rose by 4.1% in '16/17 compared to '15/16. The weather was milder, and indicated a decrease in gas usage of 0.6% in a like for like situation (see section 3.A on P.19).

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 2016/17. 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 2016 to July 31st 2017, with the baseline for comparison being the previous (2015/16) financial year. Utilities continue to be procured via Notice Ltd, which is a wholly owned subsidiary of the University of Nottingham.

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Section 1 – Total Energy Report

1.A. - Energy and Water Costs Summary

Overall energy and water costs were £11.6 million in 2016/17, an increase of 8% from the previous year.

Gas prices rose 7%, but electricity was up markedly, showing increases across the year averaging 11%, and with peak prices showing rises of 21%. Our policy of flexible energy procurement, allowed us to mitigate these rises by purchasing at times when prices were relatively low. Rising environmental taxes, particularly Renewable Obligation and Feed-In-Tariff Charges within electricity bills, continued to provide upward pressure on overall spending. From April 2017, our energy contracts were moved within the TEC (The Energy Consortium) framework, but continue to be on a flexible purchasing basis.

Energy and Water Costs				Change
	2014/15	2015/16	2016/17	'15/16 to '16/17
University Park	£ 5,865,817	£ 5,886,335	£ 6,492,810	10%
Sutton Bonington	£ 1,823,916	£ 1,647,709	£ 1,688,096	2%
Jubilee Campus	£ 1,133,034	£ 1,135,665	£ 1,513,842	33%
Others	£ 651,144	£ 657,604	£ 733,452	12%
Medical School	£ 1,609,500	£ 1,382,354	£ 1,167,173	-16%
Total	£ 11,083,411	£10,709,666	£11,595,373	8%

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

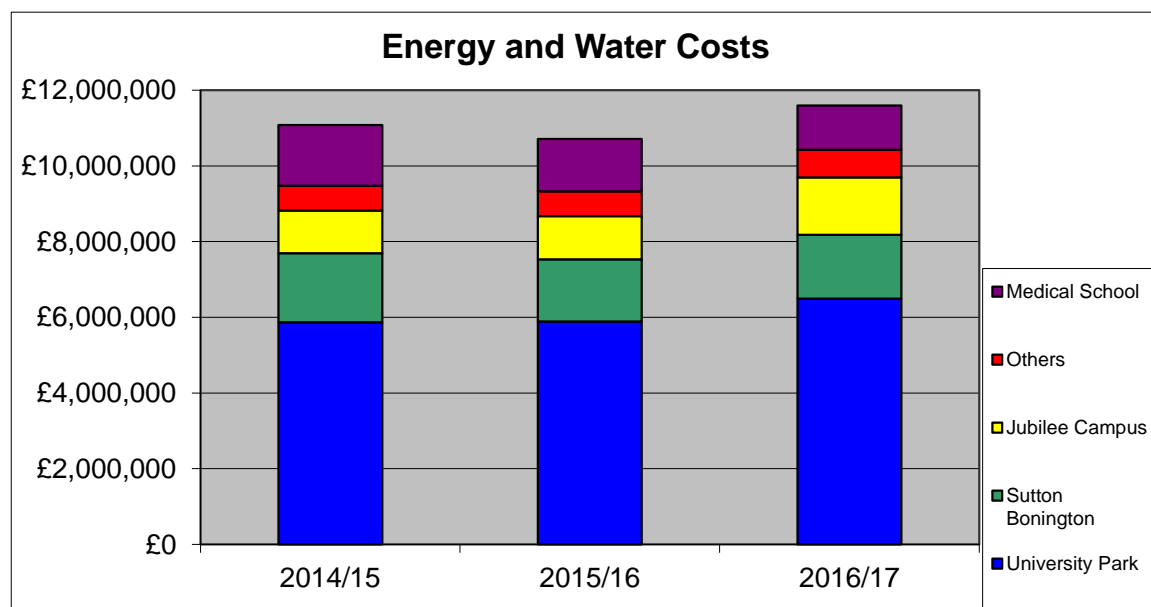


Figure 1.A.2 Graph of net energy and water costs for the last 3 years split by campus.

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	Floor Area	Cost/sq.m/annum			
		Electricity	Heating	Water	Total
University Park	347,808	£12.60	£3.51	£2.56	£18.67
Sutton Bonington	77,293	£10.64	£6.20	£4.99	£21.84
Jubilee Campus	95,601	£10.25	£3.29	£2.29	£15.83
Others	69,880	£6.97	£2.39	£1.14	£10.50
Medical School	77,644	£8.23	£5.92	£0.88	£15.03
Total	668,226	£10.94	£3.95	£2.46	£17.35

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

The floor area across all campuses increased by 4.1% from 2015/16. Note that the Medical School costs were £27.77/square metre in 2013/14, meaning that we have seen a reduction of over £10/square metre, bringing this site back into line with the others.

Utility Costs/m ²	2013/14	2014/15	2015/16	2016/17
All University Campuses Average	£18.53	£17.50	£16.68	£17.35
Medical School	£27.77	£21.31	£17.80	£15.03

Note that if taxes (VAT and CCL, see below) are taken into account, our average utility costs are now £19.35 per square metre per annum.

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

VAT costs paid by Notice Ltd on energy bills reduced significantly to £0.96 million in 2015/16, and CCL also reduced to £288,000, meaning that our energy taxes were down by 25% year on year as a result of falling costs and consumption.

The Climate Change Levy (CCL) was introduced in April 2001. On April 1st 2016 the rates rose 1.04% to 0.195p/kWh on gas and 0.9% to 0.559p/kWh on the electricity costs of all non-residential properties.

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

	2016/17				2015/16	% Diff
	Electricity	Fossil Fuels	Water	Totals	Totals	
Utility Costs	£ 7,311,262	£ 2,641,441	£ 1,642,671	£11,595,373	£10,709,666	8.3%
Climate Change Levy	£ 170,433	£ 86,499	-	£ 256,932	£288,438	-10.9%
Value Added Tax	£ 780,875	£ 296,053	-	£ 1,076,928	£957,343	12.5%
Total	£ 8,262,570	£ 3,023,993	£ 1,642,671	£12,929,233	£11,955,447	8.1%

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

1.D - 2016/2017 Net Costs Broken Down by Campus and Utilities

Energy and Water Costs				
2016/17	Electricity	Fossil Fuels	Water	Total
University Park	£ 4,382,301	£ 1,220,509	£ 890,000	£ 6,492,810
Sutton Bonington	£ 822,746	£ 479,328	£ 386,022	£ 1,688,096
Jubilee Campus	£ 979,819	£ 314,780	£ 219,243	£ 1,513,842
Others	£ 487,222	£ 166,824	£ 79,406	£ 733,452
Medical School	£ 639,173	£ 460,000	£ 68,000	£ 1,167,173
Total	£ 7,311,262	£ 2,641,441	£ 1,642,671	£11,595,373

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

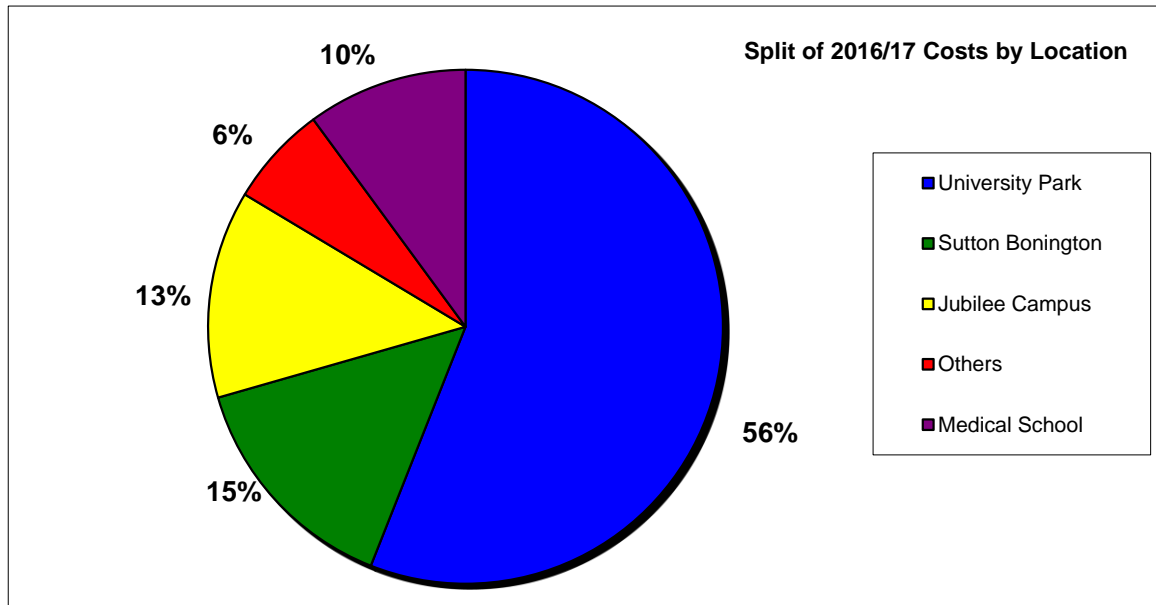


Figure 1.D.2 Chart of energy and water costs split by campus

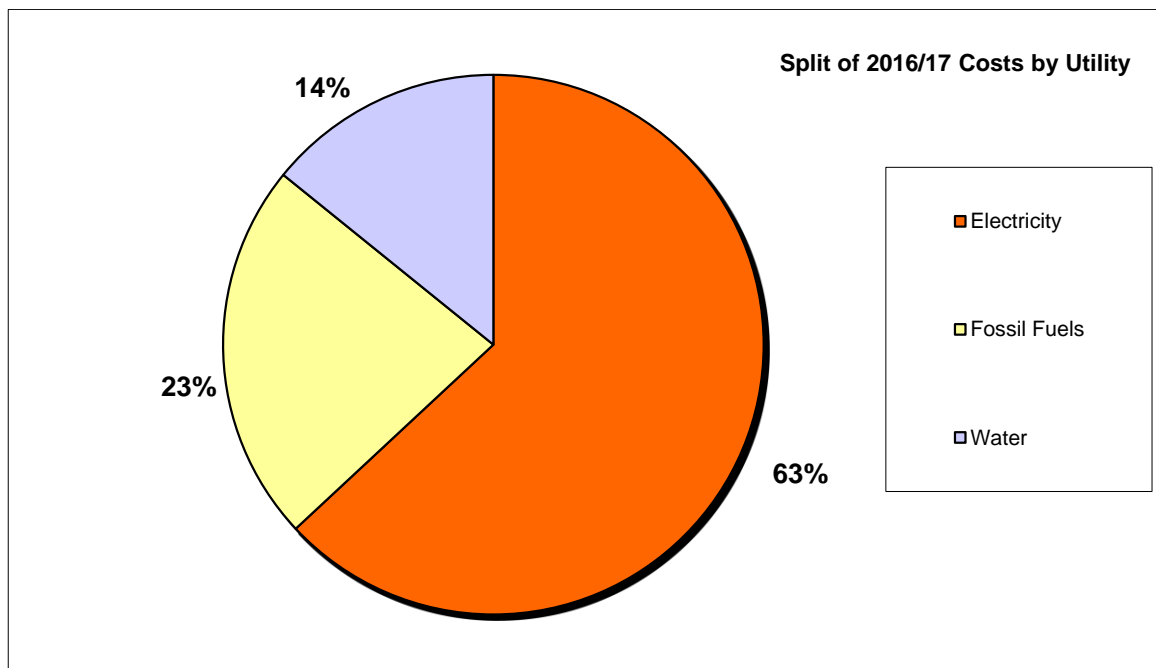


Figure 1.D.3 Chart of energy and water costs split by utility type

1.E - Energy Use Summary

Energy consumption, i.e. the total of gas and electricity, increased by just 0.5% year on year even though floor area was up by 4.1%, student numbers were up by 0.6%, and the weather was slightly colder.

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 193,159 MWh, a reduction of 3.2%.

The stand-out performance continued to be delivered at the Medical School, where continued investment has reduced energy consumption by 34% over the last two years. These measures have included new high-efficiency chillers to replace inefficient steam-powered absorption chillers, improved insulation, and the installation of double glazing on the south and west facades. The increases at Jubilee Campus were just 1.1% if the new buildings are removed from the figures.

Energy Consumption	MWh	MWh	MWh	Change
	2014/15	2015/16	2016/17	'15/16 to '16/17
University Park	105,667	108,945	108,663	-0.3%
Sutton Bonington	32,294	32,292	34,402	6.5%
Jubilee Campus	16,917	17,143	21,309	24.3%
Others	12,834	12,933	12,806	-1.0%
Medical School	35,289	28,221	23,283	-17.5%
Total	203,001	199,535	200,462	0.5%

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

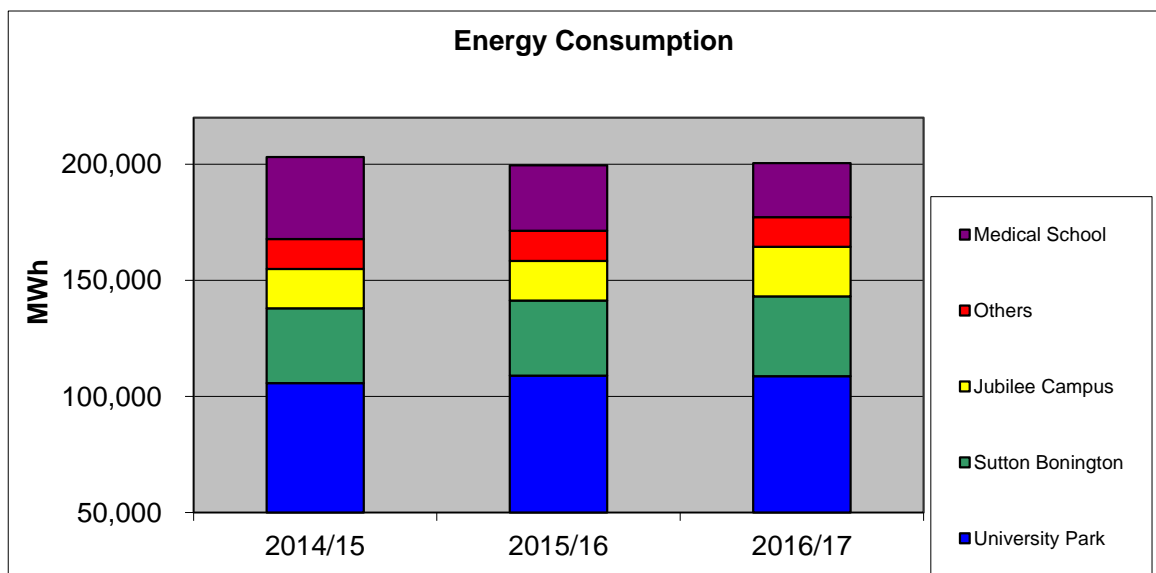


Figure 1.E.2 Graph of energy consumption for the last 3 years split by campus

1.F - Energy Use Breakdown by Campus and Utilities

Energy Consumption	MWh	MWh	MWh
2016/2017	Electricity	Fossil Fuels	Total
University Park	47,737	60,925	108,663
Sutton Bonington	8,699	25,703	34,402
Jubilee Campus	10,223	11,086	21,309
Others	5,015	7,791	12,806
Medical School	9,799	13,484	23,283
Total	81,474	118,989	200,462

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

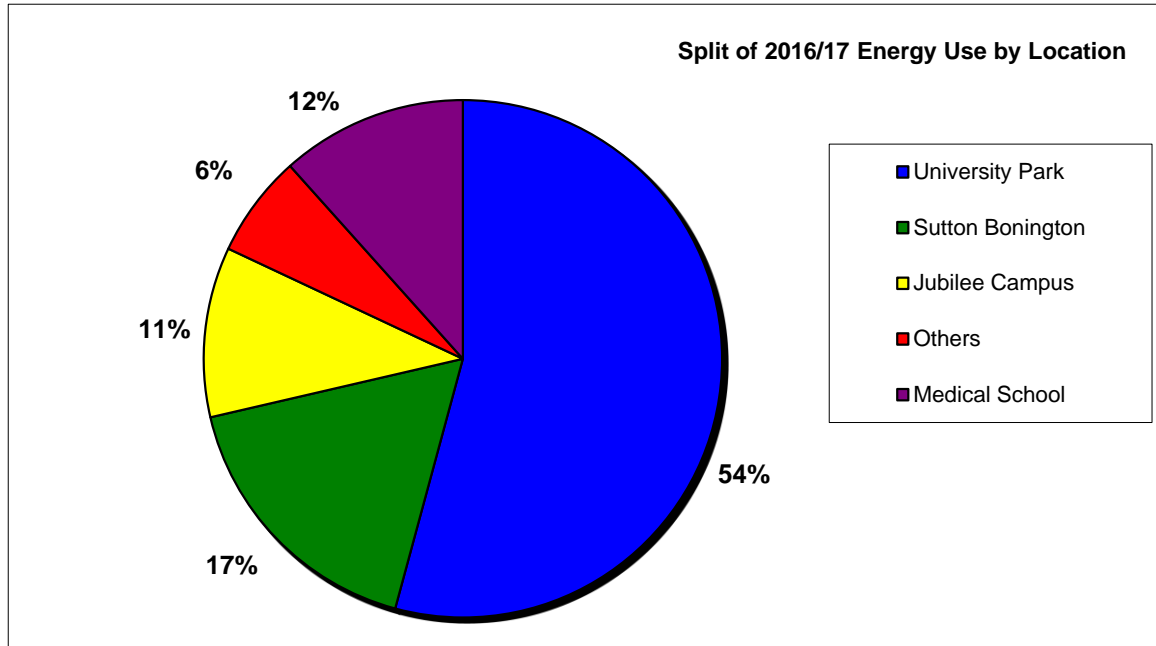


Figure 1.F.2 Pie chart of energy consumption split by campus

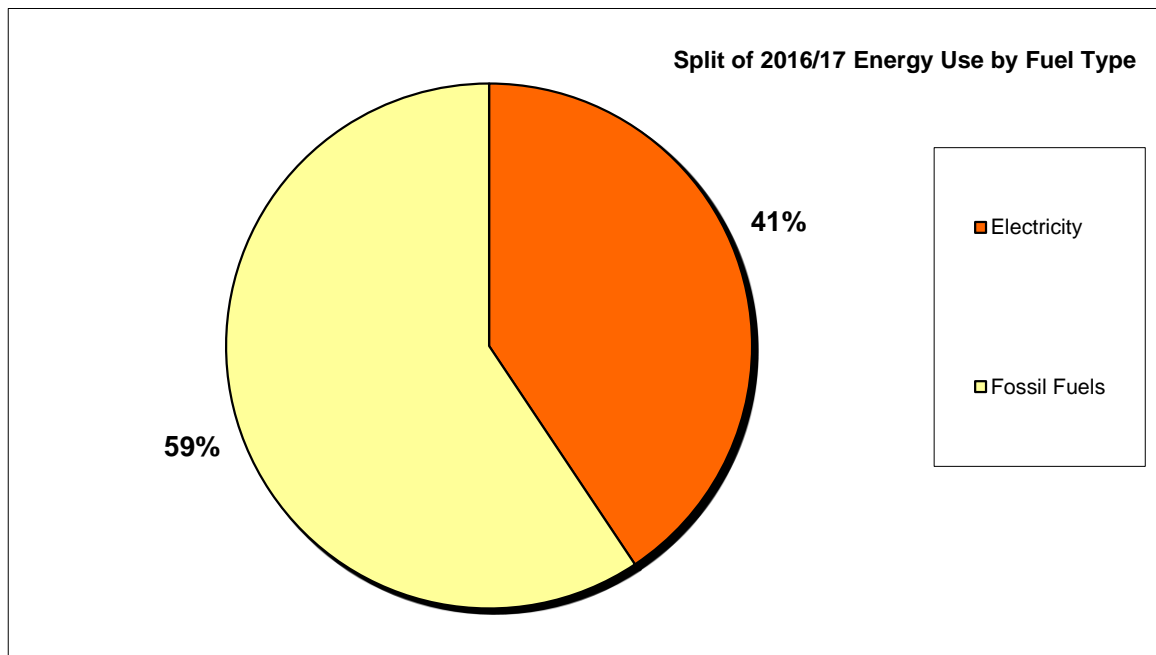


Figure 1.F.3 Pie chart of energy consumption split by utility type.

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

		2013/14	2014/15	2015/16	2016/17	Change
Floor Area (sq.m.)		629,510	633,307	642,056	668,226	4.1%
Annual Energy Usage (MWh)		197,736	203,001	199,535	200,462	0.5%
Energy Usage Per sq. m. (kWh/m2)		314	321	311	300	-3.5%

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

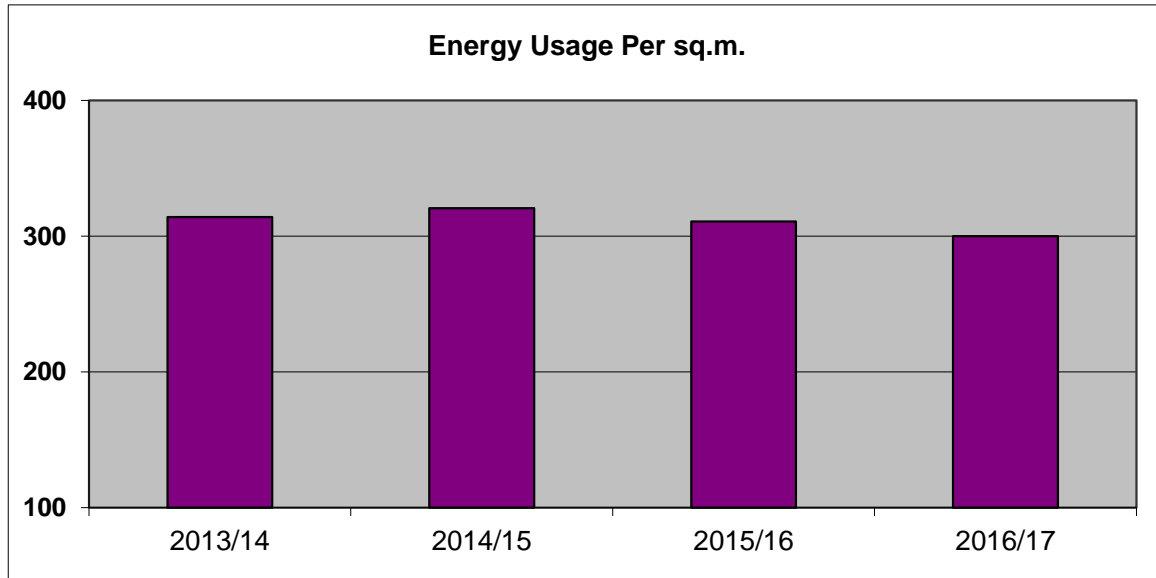


Figure 1.G.2 Graph of energy usage per unit floor area for the last four years.

		2013/14	2014/15	2015/16	2016/17	Change
Floor Area (sq.m.)		629,510	633,307	642,056	668,226	4.1%
Gross Energy and Water Costs		£13,354,000	£12,749,351	£11,955,000	£12,929,233	8.1%
Utility Cost Per sq. m.		£ 21.21	£ 20.13	£ 18.62	£ 19.35	3.9%

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

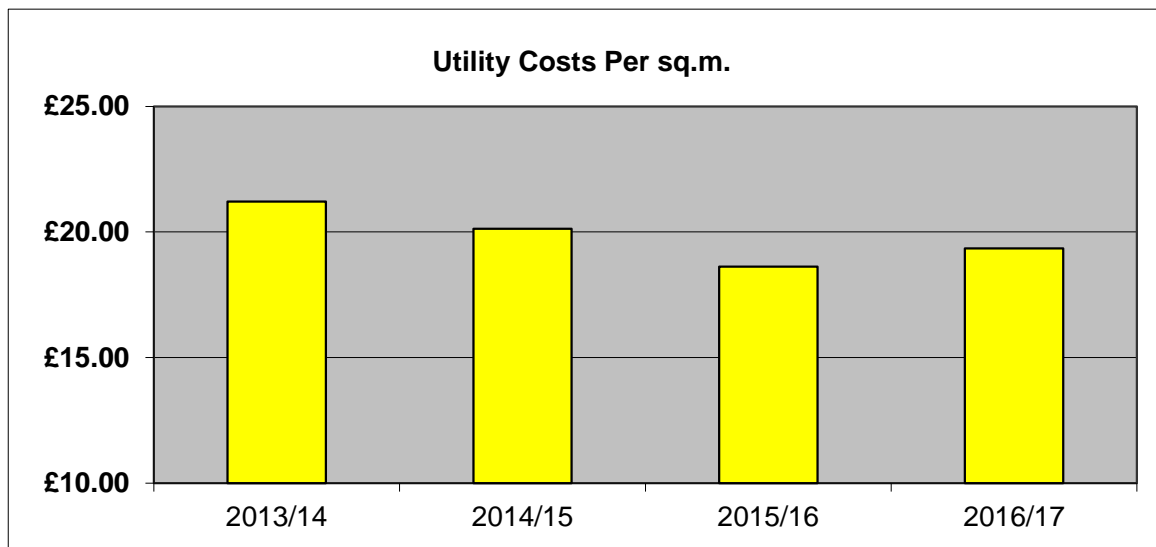


Figure 1.G.4 Graph of energy and water costs normalised by floor area for the last four years.

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

	2013/14	2014/15	2015/16	2016/17	Change
UK Student Numbers	33,369	33,197	33,435	33,620	0.6%
Annual Energy (MWh)	197,736	203,001	199,535	200,462	0.5%
Energy / Student (kWh)	5,926	6,115	5,968	5,963	-0.1%

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

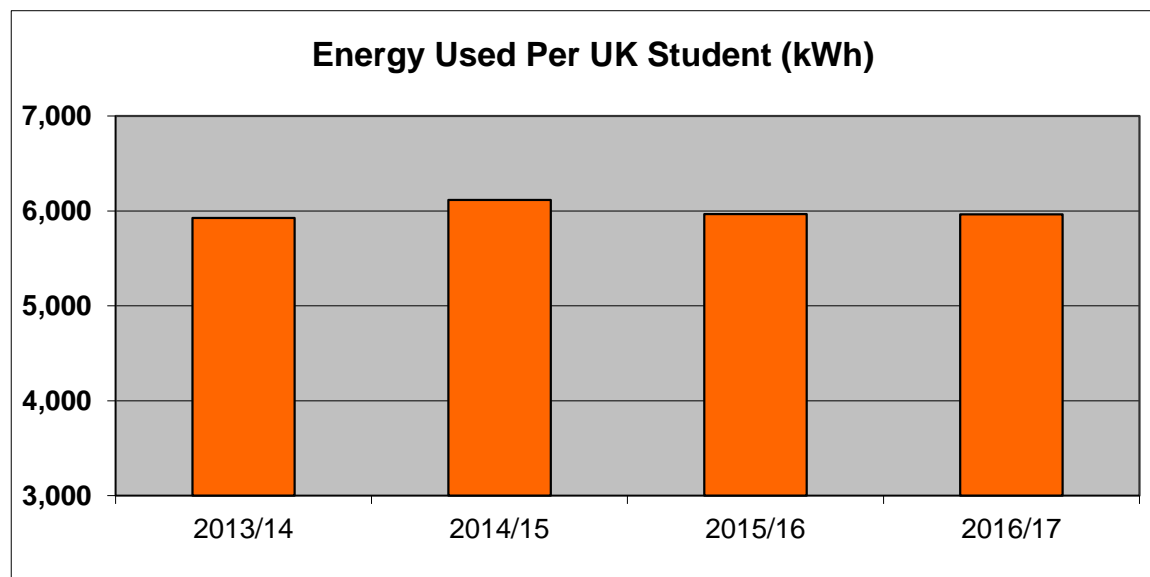


Figure 1.H.2 Graph of energy usage per UK student for the last four years.

	2013/14	2014/15	2015/16	2016/17	Change
UK Student Numbers	33,369	33,197	33,435	33,620	0.6%
Energy and Water Costs	£13,354,000	£12,749,351	£11,955,448	£12,929,233	8.1%
Utility Costs / Student	£ 400.19	£ 384.05	£ 357.57	£ 384.57	7.6%

Figure 1.H.3 Table of last four years gross energy and water costs and full-time student numbers.

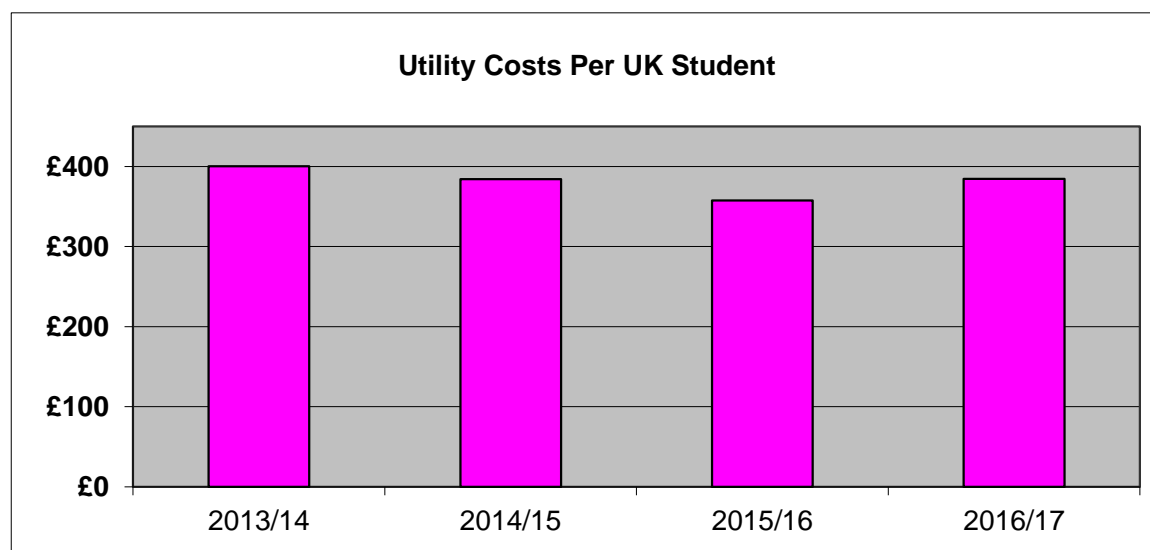


Figure 1.H.4 Graph of gross energy and water costs per UK student for the last four years.

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)	2013/14	2014/15	2015/16	2016/17	Change
Utility Costs inc. taxes	£ 13,354	£ 12,749	£ 11,955	£ 12,929	8.1%
University Expenditure	£ 545,900	£ 566,900	£ 588,600	£ 588,600	0.0%
Percentage	2.45%	2.25%	2.03%	2.20%	8.1%

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

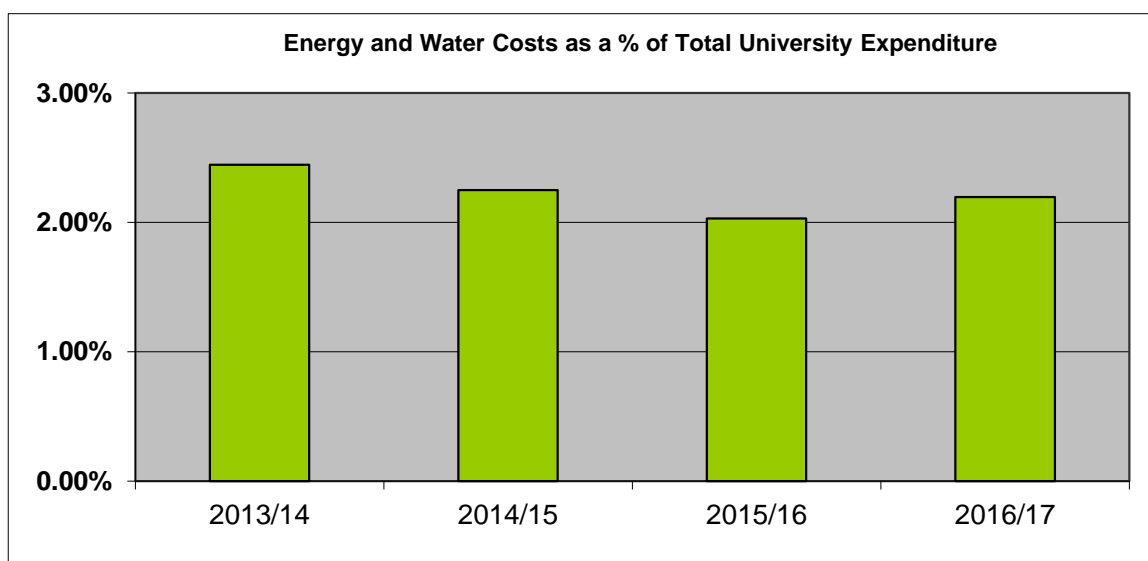


Figure 1.I.2 Graph of energy and water costs normalised by total turnover for the last four years..

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 2016 to March 2017) are listed below.

Under the Scheme, our emissions were reported as 52,590 Tonnes of CO₂ (up 0.8% from 52,177 in the previous year). Each tonne of CO₂ 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 52,590 allowances (£846,699), averaged out across our total energy consumption, equates to 0.421p/kWh.

1.K – Energy Costs Comparison to Russell Group Universities – 2015/16

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 2015/16. 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.

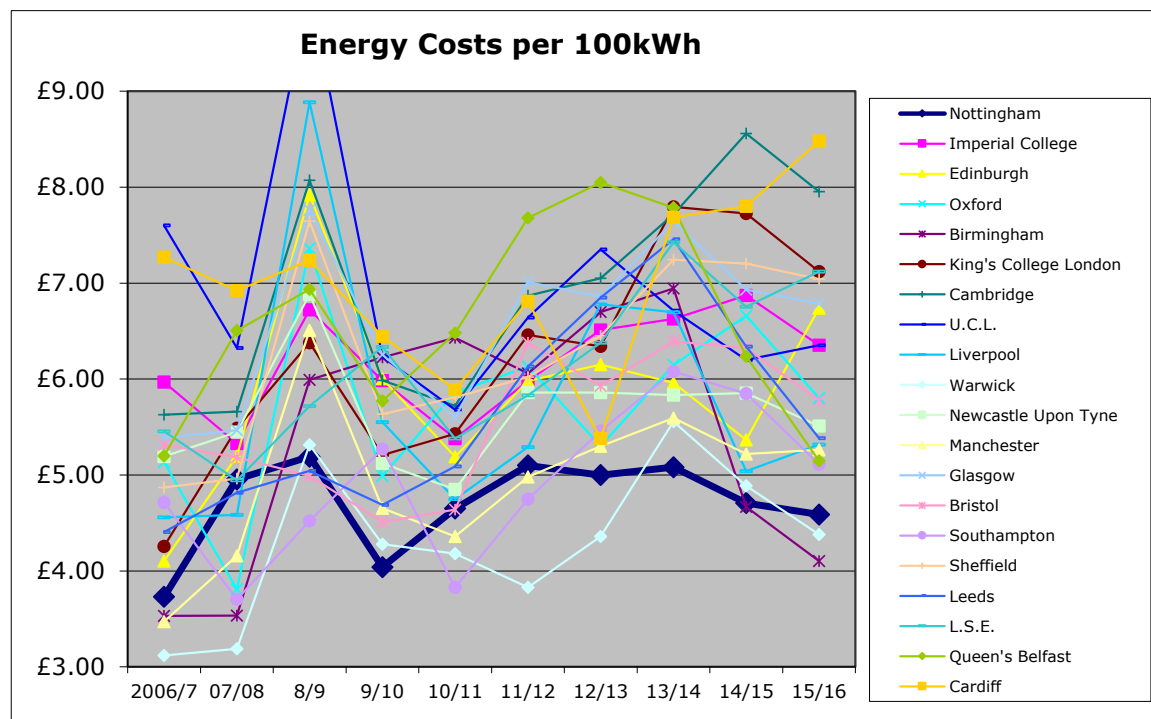


Figure 1.K.1 Graph of Russell Group Energy Costs per 100kWh.

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

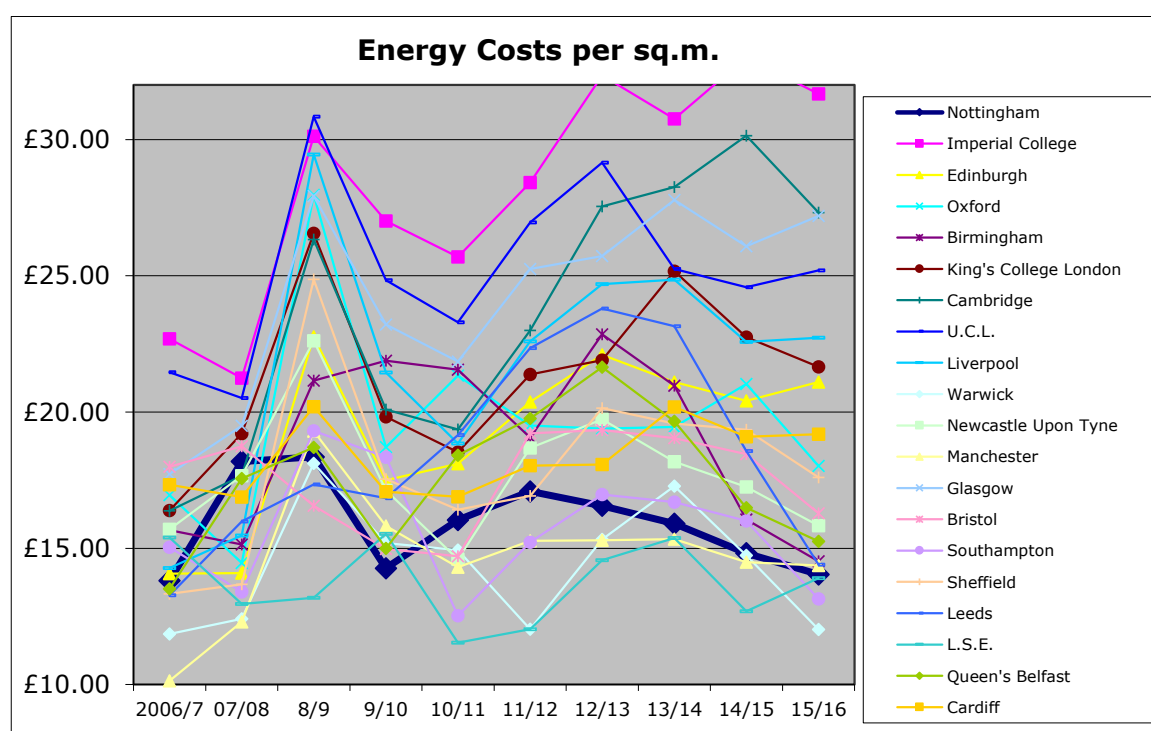


Figure 1.K.2 Graph of Russell Group Energy Costs square metre

1.L – Energy Efficiency Comparison to Russell Group Universities – 2015/16

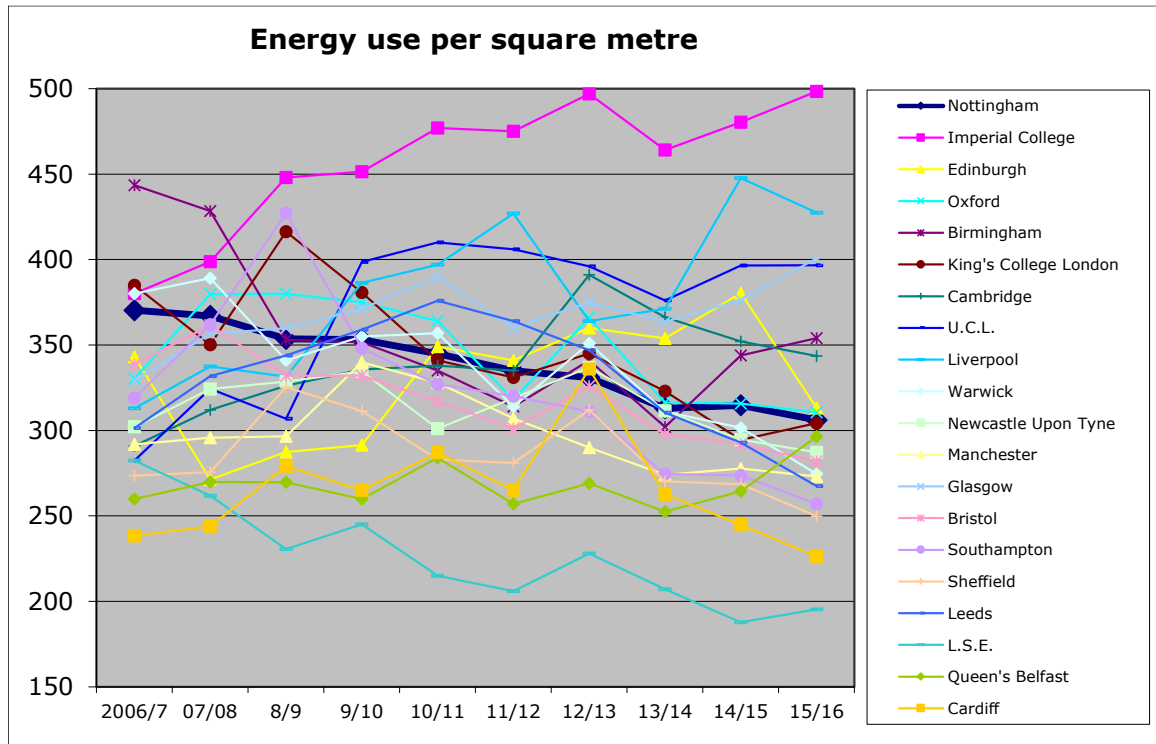


Figure 1.L.1 Graph of Russell Group Energy use per square metre.

The graphs on this page indicate that Nottingham had an energy consumption per square metre of 306kWh/m² compared to the average of 313kWh/m², and energy use per student was 6835kWh compared to the Russell Group average of 7414kWh.

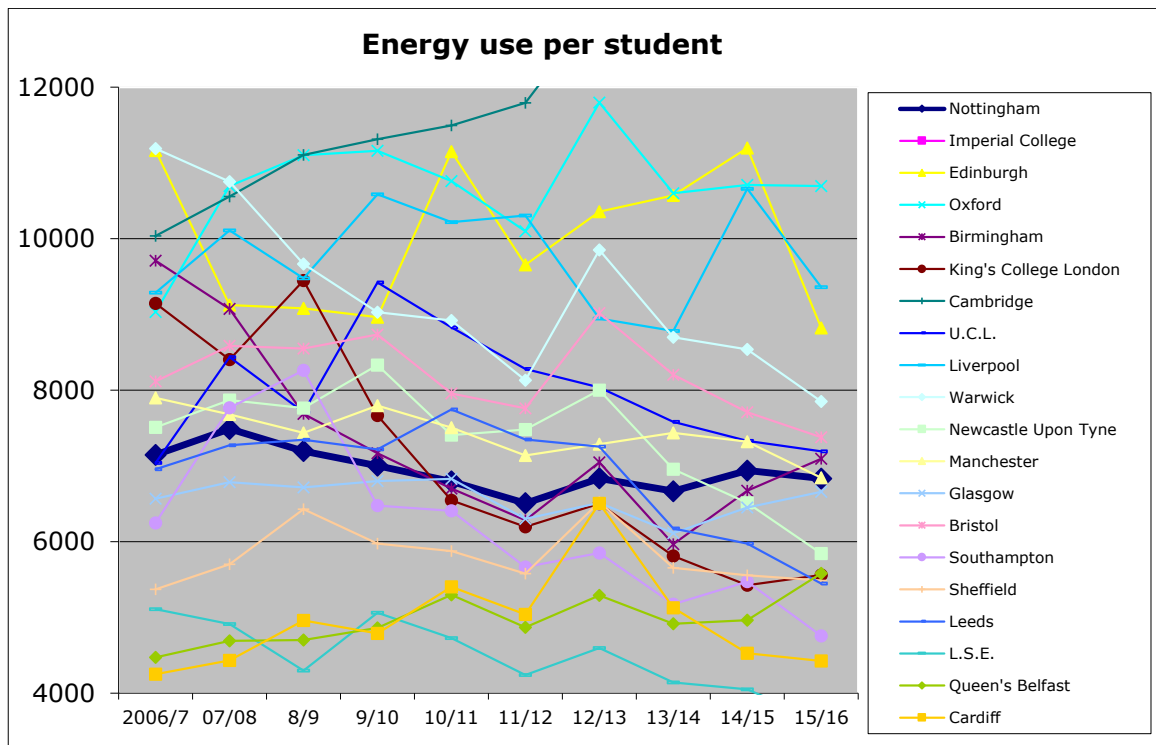


Figure 1.L.1 Graph of Russell Group Energy use per student (note Imperial is off the top of the scale at around 16,000kWh/student).

Section 2 – Electricity, Gas and Water Consumption

2.A - Electricity Consumption

Electricity consumption increased by 2.7%. However, four substantial new buildings were added to the Estate (GSK Centre for Sustainable Chemistry, David Ross Sports Village, Jubilee Conference Centre, and the Ingenuity Centre). The electricity usage of these four buildings totalled 3,119MWh, accounting for an increase of 3.9% on their own. So in a like-for-like situation, we achieved a reduction of around 1.2%.

Sutton Bonington showed further reductions in imported electricity due to the first full year of usage of the two new CHP electricity generating units. There was continued reduction in electricity usage at the Medical School despite the new electric chillers adding 476MWh on their own. Savings made elsewhere such as on pumping energy to the now decommissioned cooling towers have more than offset the increase due to the chillers.

Electricity Consumption	MWh	MWh	MWh	Change
	2014/15	2015/16	2016/17	'15/16 to '16/17
University Park	46,102	46,127	47,737	3.5%
Sutton Bonington	13,251	10,099	8,699	-13.9%
Jubilee Campus	8,316	8,544	10,223	19.6%
Others	4,480	4,583	5,015	9.4%
Medical School	9,994	9,988	9,799	-1.9%
Total	82,143	79,342	81,474	2.7%

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

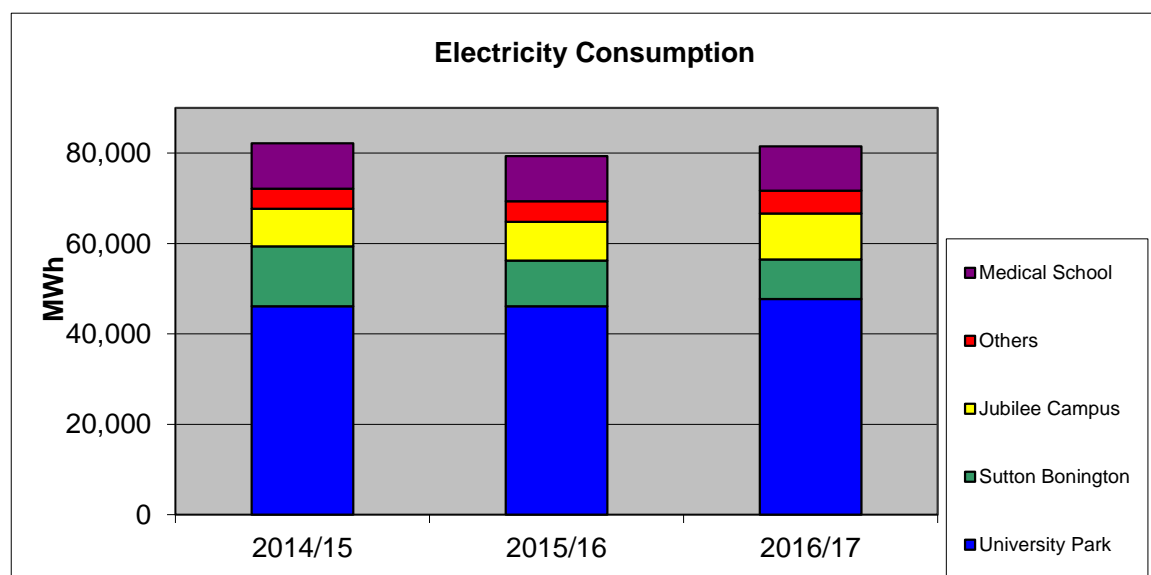


Figure 2.A.2 Graph of electricity usage for the last 3 years split by campus.

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

2.B - Electricity Costs

Electricity prices were volatile and saw significant fluctuation over the year. Annual baseload electricity prices started the year in August 2016 at around £41/MWh, before rising steeply to around £47/MWh in November and reducing to £43/MWh by July 2017. Prices for winter 2016/17 were even more volatile, at around £50/MWh, with day-ahead at around this level with spikes of up to three times this amount. Our delivered energy prices – including standing charges – increased from 8.3p/kWh last year to 10.1p/kWh, a rise of over 21%.

Energy taxes increased; whilst the energy element of the electricity bill averaged 4.84p/kWh, standing charges reached an average of 5.26p/kWh, more than 50% of the electricity bill.

From April 2017 our electricity supplier changed from Engie to EdF Energy under a flexible contract framework let by The Energy Consortium (TEC).

The University's 'sub-100kW' sites (representing the smaller properties) was retendered in January 2016, and the contract was won by Southern Electric for two years, commencing May 2016. This was a low point for electricity prices and the average price achieved was 10.28p/kWh, a reduction of 18.3% on the previous average.

Electricity Costs				Change
	2014/15	2015/16	2016/17	'15/16 to '16/17
University Park	£ 3,679,990	£ 3,813,419	£ 4,382,301	15%
Sutton Bonington	£ 1,075,835	£ 861,973	£ 822,746	-5%
Jubilee Campus	£ 692,261	£ 744,672	£ 979,819	32%
Others	£ 378,596	£ 403,326	£ 487,222	21%
Medical School	£ 650,000	£ 614,580	£ 639,173	4%
Total	£ 6,476,682	£ 6,437,971	£ 7,311,262	14%

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

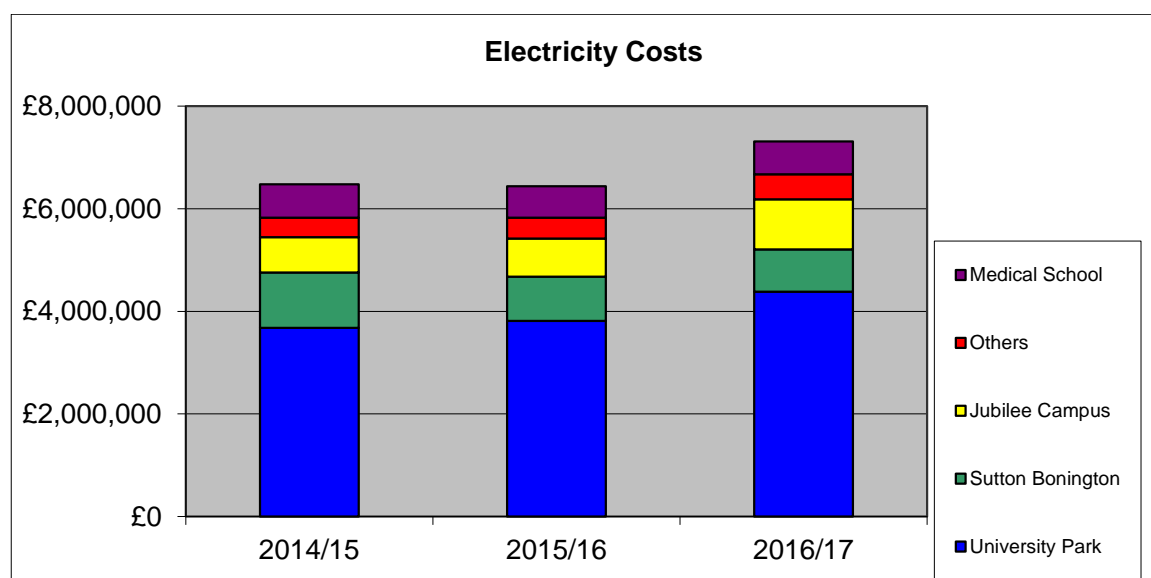


Figure 2.B.2 Graph of net electricity costs for the last 3 years split by campus.

2.C - Fossil Fuel (principally gas) Consumption

Encouragingly, our consumption of fossil fuels fell again last year, by 1%. This was despite the weather being slightly colder; an increase of 0.6% could have been expected due to this factor. More importantly, the addition of four major new buildings (GSK Sustainable Chemistry, David Ross Sports Village, Jubilee Conference Centre, and the Ingenuity Centre) added 3,463 MWh (+2.9%) of new consumption. Thus the 1% reduction was actually a 4.5% reduction in a like-for-like situation.

At a campus-by-campus level, a couple of trends continued from last year; firstly a significant fall in steam used for cooling at the Medical School continued due to the introduction of high-efficiency electric chillers. Secondly the increase in gas usage at Sutton Bonington was expected due to the increased usage of the new CHP units – this resulted in reductions in imported electricity (see Section 2A).

Fossil Fuel Consumption	MWh	MWh	MWh	Change
	2014/15	2015/16	2016/17	'15/16 to '16/17
University Park	59,566	62,819	60,925	-3.0%
Sutton Bonington	19,043	22,192	25,703	15.8%
Jubilee Campus	8,601	8,599	11,086	28.9%
Others	8,354	8,350	7,791	-6.7%
Medical School (Steam)	25,295	18,233	13,484	-26.0%
Total	120,858	120,193	118,989	-1.0%

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

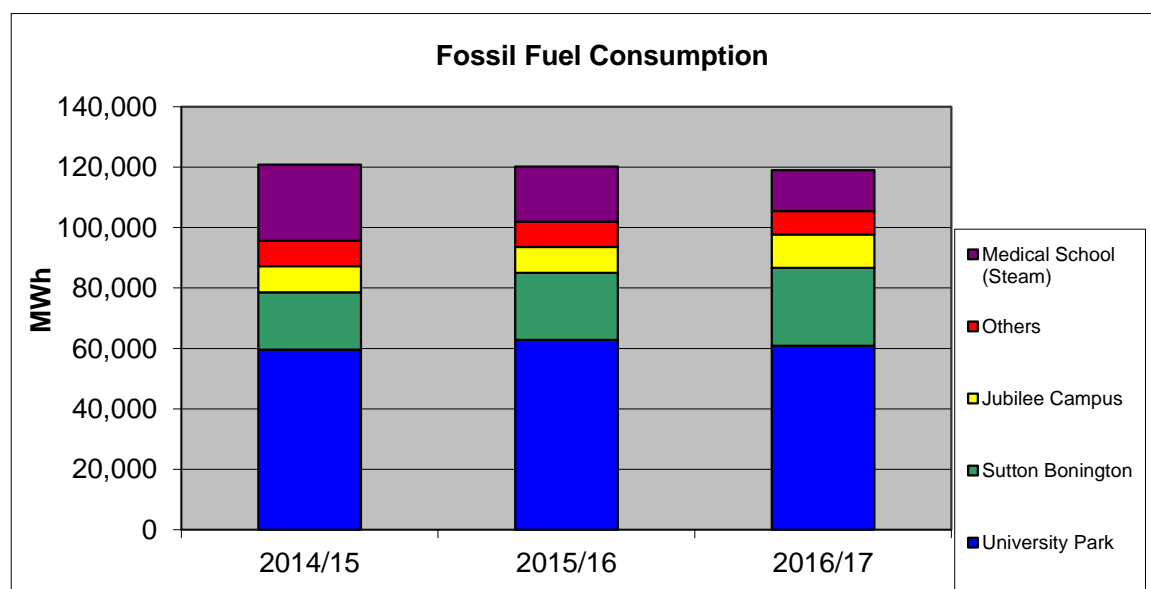


Figure 2.C.2 Graph of fossil fuel usage for the last 3 years split by campus.

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

2.D - Fossil Fuel Costs

Annual gas prices started the year at about 40p/Therm (1.37p/kWh) in August 2016. They peaked at about 49p/Therm (1.67p/kWh) in January and February 2017, before subsiding back down to 42-44p/Therm (1.43-1.50p/kWh) in the summer of 2017. Delivered gas averaged across the year cost around 2.07p/kWh, an increase of 6.7% from last year's average of 1.94p/kWh. Standing charges were around 0.7p/kWh, and so accounted for around 34% of the total.

The big increases in costs seen at Jubilee Campus were almost entirely down to the three new buildings (GSK Centre for Sustainable Chemistry, Ingenuity Centre, and Jubilee Conference Centre), with the zero-carbon biofuel used at the GSK building being relatively expensive to purchase per kWh of energy. Without the new buildings, costs were only up 3.3% at Jubilee Campus.

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).

Fossil Fuel Costs				Change
	2014/15	2015/16	2016/17	'15/16 to '16/17
University Park	£ 1,259,135	£ 1,211,403	£ 1,220,509	1%
Sutton Bonington	£ 405,206	£ 409,787	£ 479,328	17%
Jubilee Campus	£ 197,220	£ 188,003	£ 314,780	67%
Others	£ 188,306	£ 166,642	£ 166,824	0%
Medical School (Steam)	£ 865,000	£ 668,417	£ 460,000	-31%
Total	£ 2,914,868	£ 2,644,252	£ 2,641,441	0%

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

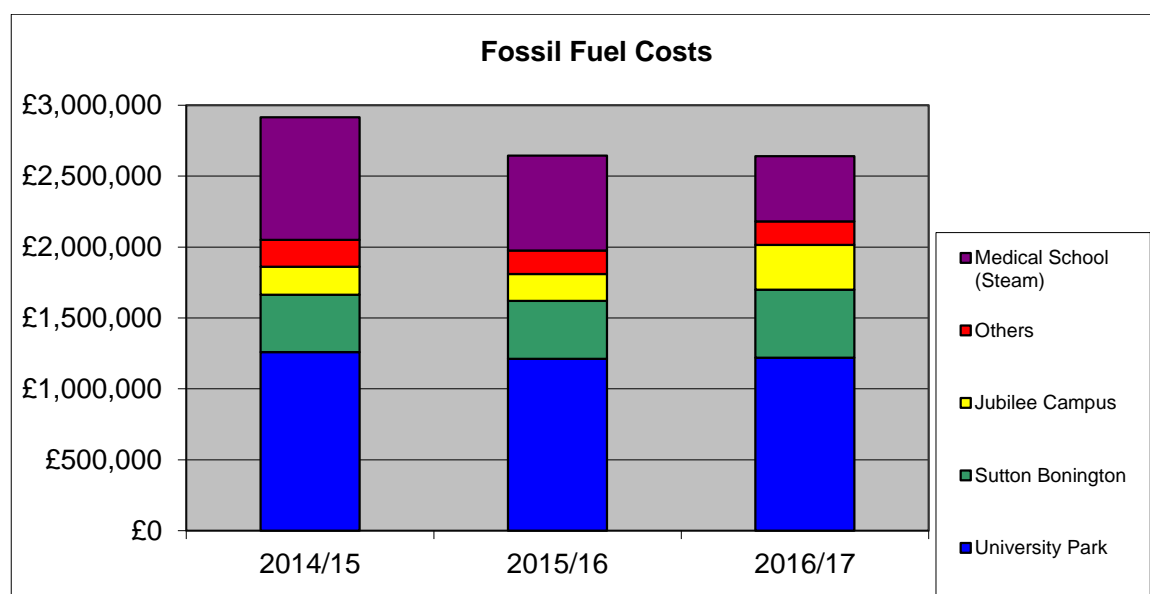


Figure 2.D.2 Graph of net fossil fuel costs for the last 3 years split by campus.

2.E - Water Consumption

All campuses, with the exception of Sutton Bonington, saw reductions in water consumption compared to 15/16 with the greatest percentage reductions occurring at the Medical School.

Water consumption was down by 6% overall year on year, with the largest real reductions occurring at University Park. This was principally due to further improvements in leakage detection on the network mains, with investment at Coates Road, Psychology, and Trent building leading to reductions of over 40,000 cubic metres. The significant reductions of over 15,000 cubic metres achieved at the Medical School were as a result of decommissioning the cooling towers as new electric chillers were introduced.

Water Consumption	cubic m. 2014/15	cubic m. 2015/16	cubic m. 2016/17	Change '15/16 to '16/17
University Park	499,793	504,856	461,955	-8%
Sutton Bonington	208,402	217,745	223,538	3%
Jubilee Campus	88,593	71,607	70,940	-1%
Others	20,329	22,246	22,006	-1%
Medical School	43,900	42,670	26,900	-37%
Total	861,016	859,124	805,338	-6%

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

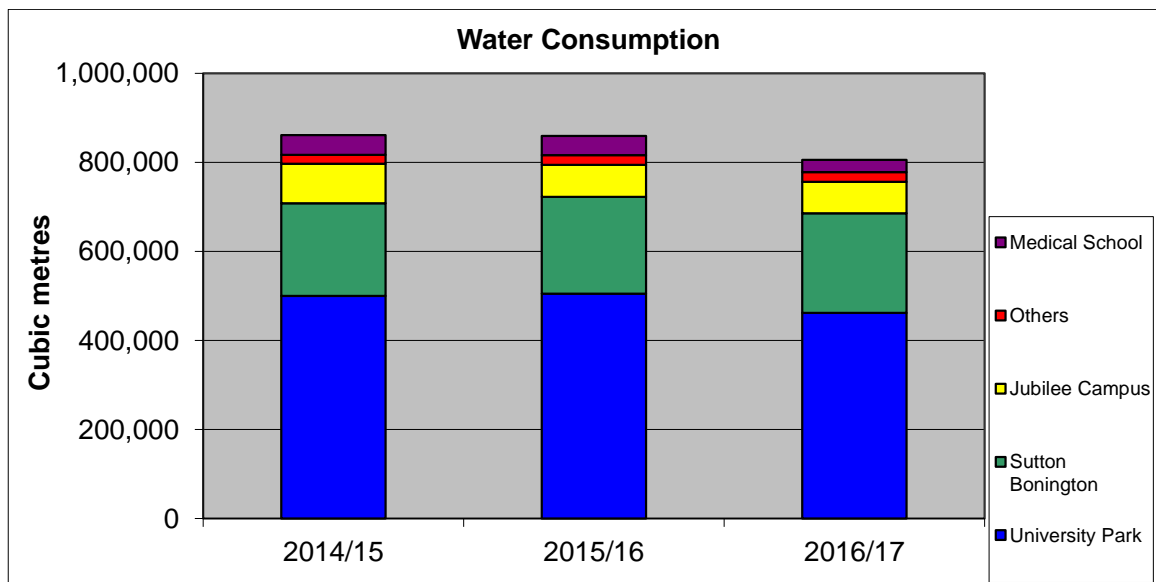


Figure 2.E.2 Graph of water usage for the last 3 years split by campus.

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 2016, prices for water were increased by 4%, and by 6.4% for used water. These price increases affected the bulk of the year, but then prices changed again in April 2017, affecting the last three months of the financial year, with water supply up by 5.9% and used water discharge costs down by 9.3%.

Water Costs	2014/15	2015/16	2016/17	Change
				'15/16 to '16/17
University Park	£ 926,692	£ 861,513	£ 890,000	3%
Sutton Bonington	£ 342,875	£ 375,948	£ 386,022	3%
Jubilee Campus	£ 243,553	£ 202,990	£ 219,243	8%
Others	£ 84,242	£ 87,636	£ 79,406	-9%
Medical School	£ 94,500	£ 99,357	£ 68,000	-32%
Total	£ 1,691,861	£ 1,627,443	£ 1,642,671	1%

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

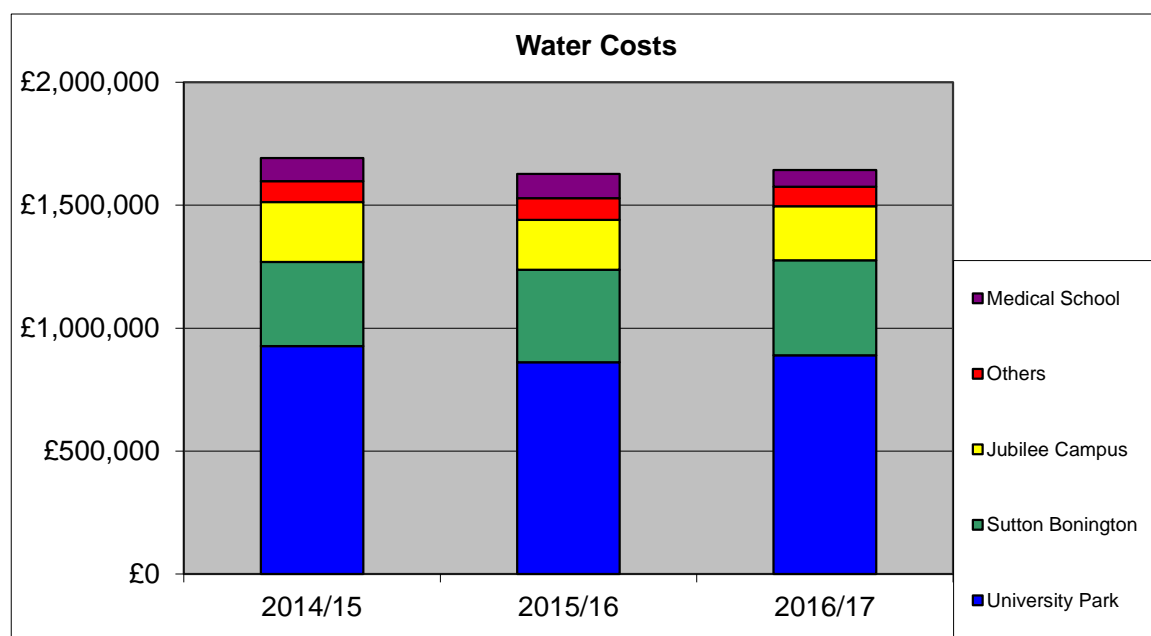


Figure 2.F.2 Graph of water costs for the last 3 years split by campus.

Section 3 – Environmental Considerations

3.A - Weather Data – Degree Days

Temperatures overall in 2016/17 were very similar to 2015/16, indicating an expected increase of just 0.6% in fossil fuel use compared to the previous year. The Autumn was a little cooler than usual, but the Spring was mild.

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.

2016/17	Deg. Days 20 Yr Avg	Deg. Days 2014/15	Deg. Days 2015/16	Deg. Days 2016/17	'14/15 to '16/17 Change
Aug	32	46	30	22	-26.7%
Sep	67	49	101	34	-66.3%
Oct	150	104	145	155	6.9%
Nov	257	219	187	295	57.8%
Dec	341	322	178	285	60.1%
Jan	336	343	304	362	19.1%
Feb	294	324	305	266	-12.8%
Mar	268	285	306	221	-27.8%
Apr	209	186	250	205	-18.0%
May	131	145	118	107	-9.3%
Jun	65	70	50	37	-26.0%
Jul	34	38	26	26	0.0%
Total	2,184	2,131	2,000	2,015	0.8%
				Weather modifier (75%)	0.6%

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

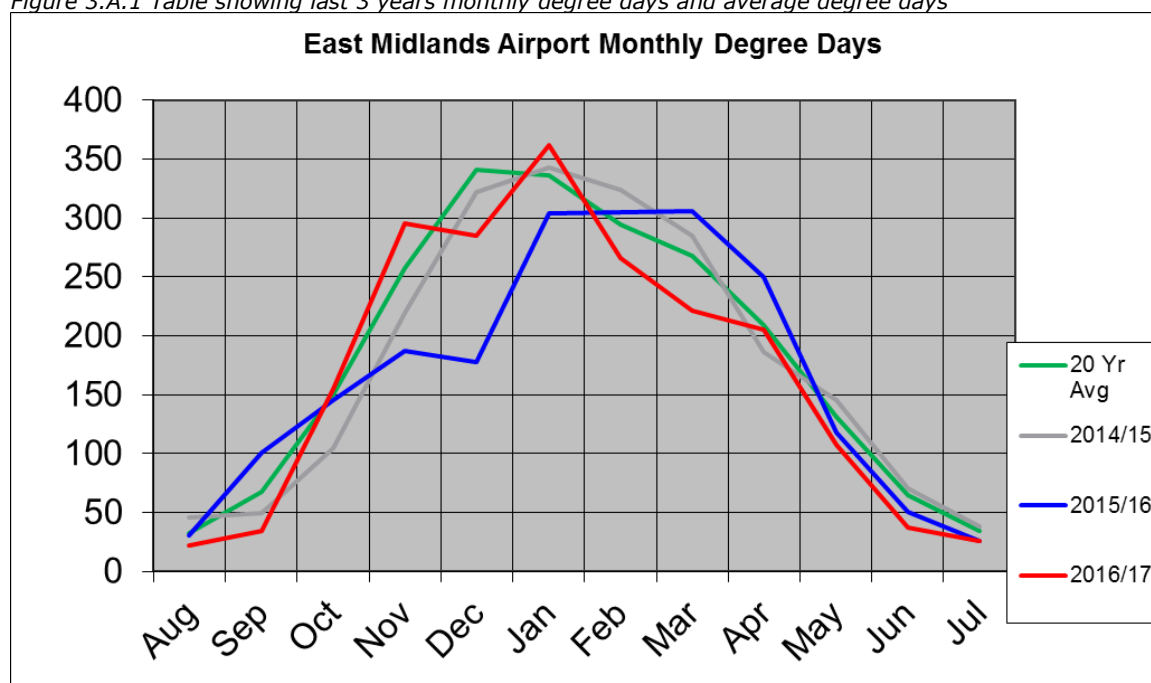


Figure 3.A.2 Graph showing last three years monthly degree days and average degree days

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 14.4% of our energy usage.

	Units	University Total '16/17	New Buildings	% due to new build
2.A Electricity Consumption	MWh	81,474	12,647	18.4%
2.C Fossil Fuel Consumption	MWh	118,989	12,543	11.8%
1.E Energy Use Total	MWh	200,462	25,190	14.4%
2.E Water Consumption	cu.m.	805,338	75,005	10.3%
1.A Energy & Water Costs	£	£11,595,373	£816,499	7.6%
1.G Floor Area	m ²	668,226	108,381	19.4%

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	7,699
Business Sch North	PV	13,365
Computer Sciences	PV	6,421
Derby Hall	PV	46,496
Lincoln Hall	PV	39,369
Si Yuan Chinese Studies	PV	7,952
Aerospace Technology	PV	10,815
Energy Technologies Building	PV	10,800
Environmental Education Centre	PV	15,517
Sustainable Research Building	PV	5,274
Ingenuity Centre (TEC)	PV	2,868
Riverside Sports Pavilion A	PV	18,183
The Barn	PV	3,333
Sustainable chemistry	PV	205,223
George Green Library	PV	31,716
Orchard Hotel	PV	7,485
Veterinary School	PV	120,258
Total		552,774
Si Yuan Chinese Studies	Solar thermal	2,284
Geospatial	Biomass	51,580
BioEnergy	Biomass	150,650
Total		204,514

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

PV production was up by 73% year on year, largely due to the new GSK Centre for Sustainable Chemistry. 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.

3.D – Comparison with Overseas Campuses (2014/15)

It appears that the overseas campuses have markedly different footprints to the UK; reflecting their unique characteristics. Data has been provided by Estates Office staff at the campuses and will now be monitored going forwards to determine trends.

	UK	China	Malaysia
Floor Area (m ²)	633,307	66,487	35,127
Electricity (MWh)	82,143	5,100	12,215
Gas (MWh)	120,858	0	0
Total Energy (MWh)	203,001	5,100	12,215
Water (m ³)	861,016	71,005	129,295

Figure 3.D.1 Table comparing UK energy and water usage with the overseas campuses.

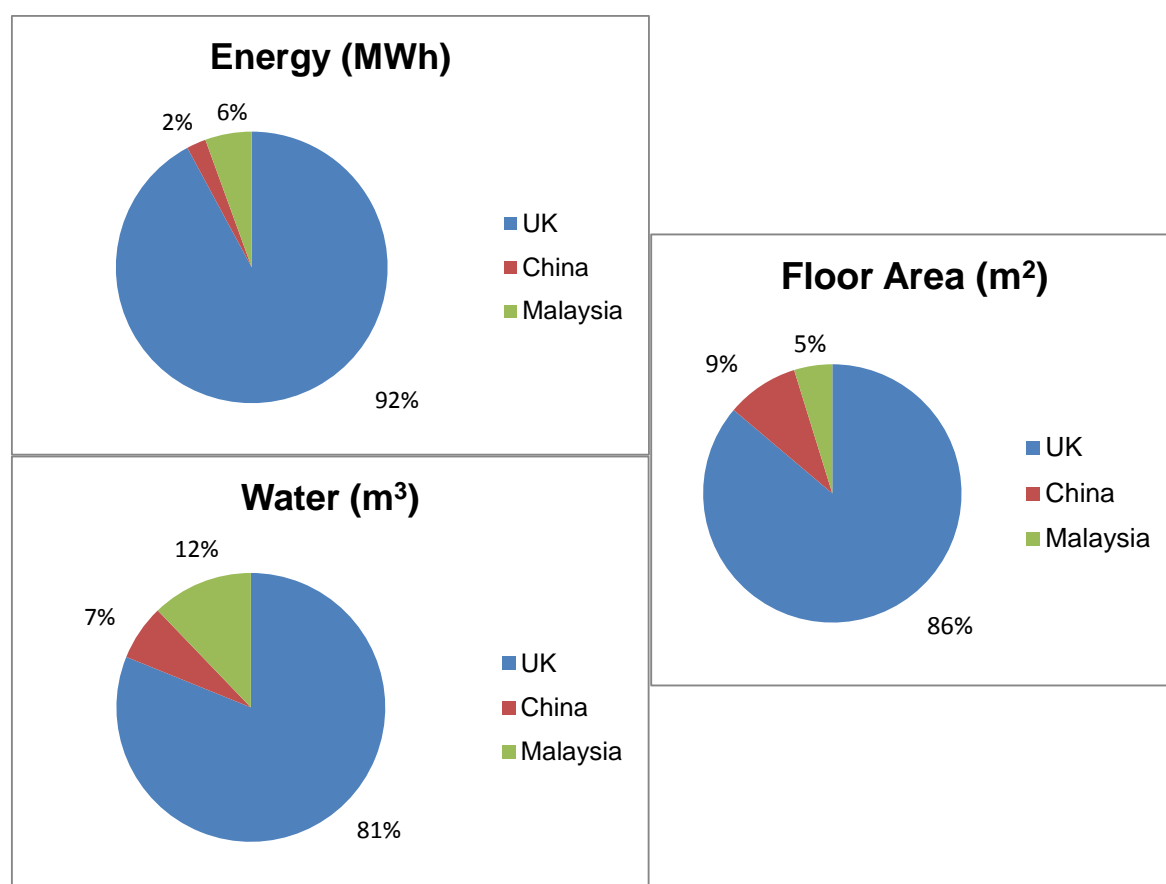


Figure 3.D.2 Graphs comparing Energy, water and floor area on University of Nottingham Campuses.

Energy and Water Efficiency

	UK	China	Malaysia
Electricity (kWh)/m ²	130	77	348
Water (m ³)/m ²	1.36	1.07	3.68

Figure 3.D.3 Table showing overseas campuses energy and water usage per square metre.

Section 4 – Appendices

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

New Sites		2016/17	2016/17	2016/17		2016/17	Floor Area
Main Campus		Elec kWh	Gas kWh	Water m3		Cost £	
	Engineering Science Learning Centri	1661	401,131	670,000	1,737	£54,737	3,511
	Humanities	1671	374,645	14,756	1,583	£38,722	4,303
(2)	Orchard Hotel	1681	1,352,248	1,359,070	13,318	£179,719	9,509
	George Green Library extn	1281	526,491	500,000	1,679	£62,773	4,377
	D. Ross Sports Village	2165	1,658,089	948,733	4,731	£185,502	17,018
	Mathematical Sciences	1561	386,880	625,000	1,030	£51,038	4,674
	New eco-houses		50,000	11,410	200	£5,605	526
	Totals	4,749,484	4,128,969	24,278		£578,097	43,918
New Sites		2016/17	2016/17	2016/17		2016/17	Floor Area
Sutton Bonington		Elec kWh	Gas kWh	Water m3		Cost £	
	Bio-energy and Brewing Sciences	5781	627,312	521,804	3,750	£76,076	3,493
	Bio-energy BIOMASS	5781		170,989	0	£7,409	0
	Gateway Building	5771	812,029	497,106	14,385	£115,720	3,253
	Gustafson Glasshouse		83,809	413,488	400	£17,971	400
	Future Crop Glasshouses	5445	122,075	174,574	400	£16,699	312
	The Barn	5075	404,404	430,000	2,607	£46,536	3,797
	Totals	2,049,629	2,207,961	21,542		£233,874	11,255
New Sites		2016/17	2016/17	2016/17		2016/17	Floor Area
Jubilee Campus		Elec kWh	Gas kWh	Water m3		Cost £	
(1)	6 Triumph Road	7405	46	0	20	£1,229	324
(1)	9 Triumph Road	7400	44,913	0	410	£19,907	399
(1)	Institute of Mental Health	7370	283,496	277,466	1,697	£36,115	3,074
	Yang Fujia (International House)	7320	400,000	464,384	1,295	£50,039	3,400
	Starbuck's Café	7305	88,159	28,134	200	£9,433	151
	The Amenities Building (Xu Yafen)	7330	420,000	156,057	2,893	£49,300	2,365
(2)	Jubilee Conference Centre	7211	1,030,508	1,431,869	0	£126,499	8,514
(1)	Ingenuity Centre (TEC Building)	7440	65,000	125,100	200	£11,661	2,292
	Nottingham Geospatial Building	7350	342,584	84,907	2,169	£38,509	2,944
	Geospatial BIOMASS	7350		74,654		£3,395	0
(1)	Sir Colin Campbell Building	7340	700,000	381,662	1,110	£74,898	4,534
	Energy Technologies Building	7360	764,791	551,700	10,223	£103,373	3,177
	Energy Technologies Bldg BIOFUEL	7360		0		£0	0
(1)	Romax Building	7390	330,000	320,961	465	£39,138	2,950
	Imperial Tobacco Site	7460	238,995	143,528	717	£46,548	0
	Woolpack House	7480	46,572	63	0	£4,761	1,978
	GSK Sustainable Chemistry	7430	364,727	48,835	1,813	£38,660	4,540
	GSK Sustainable Chem. BIOFUEL	7430		907,786		£84,664	0
	Gatehouse Lodge	7470	115,000	35,098	700	£2,335	439
	Aerospace Technology Centre	7380	163,337	277,466	608	£22,550	1,934
	Si Yuan Centre for Chinese Studies	7410	142,212	50,135	100	£14,809	2,078
	Totals	5,540,340	5,359,805	24,620		£777,821	45,093
New Sites		2016/17	2016/17	2016/17		2016/17	Floor Area
Others		Elec kWh	Gas kWh	Water m3		Cost £	
	Clinical Sciences City Hosp Ph2	3325	79,142	130,115	51	£11,628	2,000
	Derby School of Nursing	3571	92,543	250,000	278	£13,984	1,996
	Unit 4 Easter Park	6931	0	21,742	36	£3,462	1,188
	Vaughan Parry Williams Pav.& hocl	6314	70,000	100,000	500	£9,604	823
	Riverside Grove Farm Sports	6122	65,743	344,155	3,700	£20,604	2,108
	Totals	307,428	846,012	4,565		£38,677	8,115
New Sites		2016/17	2016/17	2016/17		2016/17	Floor Area
Main Campus		Elec kWh	Gas kWh	Water m3		Cost £	
	Sutton Bonington	2,049,629	2,207,961	21,542		233,874	11,255
	Jubilee Campus	5,540,340	5,359,805	24,620		777,821	45,093
	Others	307,428	846,012	4,565		38,677	8,115
	Totals	12,646,881	12,542,747	75,005		£816,499	108,381

Note that some of the buildings listed above have not yet been operational for a full year.

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		2016/17	2015/16	% change	2016/17	2015/16	% change	
Main Campus		kWh	kWh	kWh	£	£	£	
	Main Campus Invoices	1000	47,717,809	46,099,177	4%	£4,380,091	£3,810,229	15%
	Lenton Lodge	2251	11,200	19,000	-41%	£1,050	£1,900	-45%
	Lenton Eaves (UNSSC) (2)	1461	4,000	4,000	0%	£530	£560	-5%
	Lenton Eaves (UNSSC) (1)	1461	3,150	3,200	-2%	£440	£480	-8%
	Redcourt Lodge	2222	1,200	1,200	0%	£190	£250	-24%
(2)	East Midlands Conference Centre	1481	1,257,841	1,340,400	-6%			Inc. in 'Main Campus HV'
(2)	Orchard Hotel	1681	1,352,194	1,230,900	10%			Inc. in 'Main Campus HV'
(2)	Conference Centre Cottage	1482	39,351	82,117	-52%			Inc. in 'Main Campus HV'
Total of 5 accounts		Totals	47,737,359	46,126,577	3%	£4,382,301	£3,813,419	15%
Electricity Invoices		2016/17	2015/16	% change	2016/17	2015/16	% change	
Sutton Bonington		kWh	kWh	kWh	£	£	£	
	Sutton Bonington Campus	6800	8,061,065	9,444,598	-15%	762,961	793,880	-4%
	Centre for Dairy Science Innovation	6500	529,453	550,834	-4%	46,268	54,840	-16%
	Melton Lane Building A	5433	25,000	22,500	11%	2,300	2,183	5%
	St.Michael's House (Flats 1-5)	6841	20,595	22,144	-7%	2,264	2,489	-9%
	St.Michael's Close (Flats 10-15)	6840	12,606	5,197	143%	1,508	790	91%
	Bunny Park Farm	6860	10,893	11,038	-1%	1,186	1,310	-9%
	50 College Road	6819	9,000	360	2400%	1,180	170	594%
	Eviton House (68 College Road)	5891	7,200	7,900	-9%	780	900	-13%
	24 College Road	6805	4,800	4,900	-2%	640	660	-3%
	Dairy Herdsman's House	6500	4,400	4,600	-4%	640	630	2%
	St.Michael's Flats Nos 6&7	6842	4,132	7,600	-46%	796	1,150	-31%
	St.Michael's Flats Nos 8&9	6843	3,838	8,900	-57%	804	1,300	-38%
	44 College Road	6814	3,400	4,600	-26%	530	650	-18%
	40 College Road	6811	2,500	3,700	-32%	420	540	-22%
	45 College Road	6815	500	510	-2%	190	190	0%
	Manor Farm Pump House Kingstons	6910	0	0	-	139	145	-4%
	Manor Farm Soar Irrigation Pump	6910	0	0	-	140	145	-4%
Total of 17 accounts		Totals	8,699,383	10,099,381	-14%	£822,746	£861,973	-5%
Electricity Invoices		2016/17	2015/16	% change	2016/17	2015/16	% change	
Jubilee Campus		kWh	kWh	kWh	£	£	£	
	Jubilee Campus Main HV Supply	7000	6,025,096	5,730,850	5%	£563,466	£482,323	17%
	New HV Supply 2012, E. of Tri.Rd	7000	1,608,071	1,453,466	11%	£151,716	£121,860	25%
(2)	Jubilee Conference Centre	7211	1,030,508	0	-	£96,608	£0	-
	Newark & Southwell Halls	7000	614,460	622,540	-1%	£61,543	£56,220	9%
	Jubilee Sports Centre + Starbucks	7301	456,575	447,444	2%	£48,831	£43,515	12%
	Imperial Tobacco Site	7460	238,995	36,968	546%	£25,987	£10,517	147%
	Gatehouse Lodge	7470	115,000	48,000	140%	£10,200	£4,700	117%
	Woolpack House	7480	80,000	11,000	627%	£11,500	£2,500	-
(1)	9 Triumph Road (ex Dairy Crest Site)		44,913	87,939	-49%	£8,907	£11,497	-23%
	Charnock Ave Sports Pavilion	7201	9,200	10,500	-12%	£1,020	£1,260	-19%
(1)	6 Triumph Rd (ex Dairy Crest, opp 9 Trium		46	95,680	-100%	£42	£10,281	-100%
(1)	Sir Colin Campbell Building	7340	600,000	600,000	0%			Inc. in 'J.C. Main Supply'. Estd
(1)	Romax Building	7390	320,000	350,000	-9%			Inc. in 'New supply 2012' Estd
(1)	Institute of Mental Health	7370	283,496	266,905	6%			Inc. in 'New supply 2012'
(1)	Ingenuity Centre (TEC)	7440	50,000	0	-			Inc. in 'New supply 2012'
Total of 11 accounts		Totals	10,222,864	8,544,388	20%	£979,819	£744,672	32%
Electricity Invoices		2016/17	2015/16	% change	2016/17	2015/16	% change	
Others		kWh	kWh	kWh	£	£	£	
	King's Meadow Campus	6901	2,447,540	2,081,177	18%	£224,448	£168,679	33%
	Derby Medical School	3561	1,285,296	1,265,891	2%	£120,844	£106,313	14%
	Clinical Sciences (City Hospital) Ph	3325	1,024,440	1,024,440	0%	£109,094	£103,899	5%
	Clinical Sciences (City Hospital) Ph	3325	79,142	65,362	21%	£8,428	£6,629	27%
	Riverside New Changing Rooms	6122	65,743	51,646	27%	£8,754	£6,248	40%
	Highfields Sports Ground	6311	61,100	58,822	4%	£5,720	£6,211	-8%
	Highfields Hockey Pitch	6311	37,161	5,314	-	£8,155	£1,687	-
	Boat House	6321	5,400	5,300	2%	£640	£680	-6%
	Grove Farm - Old Farmhouse	6121	5,200	5,500	-5%	£630	£700	-10%
	Grove Farm	6123	3,900	2,912	34%	£510	£429	19%
	Grove Farm - Changing Rooms	6122	0	10,000	-100%	£0	£1,000	-100%
	Unit 2 Genesis Park		0	4,453	-	£0	£554	-
	522 Derby Road (ex. Mansells)	7420	0	2,640	-100%	£0	£298	-100%
Total of 13 accounts		Totals	5,014,922	4,583,456	9%	£487,222	£403,326	21%
Electricity Invoices		2016/17	2015/16	% change	2016/17	2015/16	% change	
Medical School		kWh	kWh	kWh	£	£	£	
	Medical School		7,123,163	7,683,562	-7%	£580,000	£576,180	1%
	Embedded units (Q.M.C.)		2,200,000	2,143,183	3%	£0	£21,206	-100%
	New chillers supply, 2016		475,923	161,400	-	£59,173	£17,194	-
Totals		Totals	9,799,086	9,988,145	-2%	£639,173	£614,580	4%

4.C - Appendix C – Fossil Fuel Data

	Gas Invoices		2016/17	2015/16	% change	2016/17	2015/16	% change	
	Main Campus		kWh	kWh	kWh	£	£	£	
	Central Heating Station	1000	26,656,656	27,912,053	-4%	£498,537	£490,036	2%	
	Rutland Hall & Sherwood Hall	2191	2,500,572	2,425,662	3%	£50,068	£47,249	6%	
	Bio- Molecular Sciences Phase 2	1353	2,087,283	2,063,272	1%	£40,496	£36,391	11%	
	Cripps Hall	2171	2,042,182	2,010,358	2%	£41,804	£39,847	5%	
	Hugh Stewart Hall	2181	2,001,165	2,196,705	-9%	£41,690	£43,472	-4%	
	Derby Hall	2121	1,845,888	1,897,009	-3%	£36,350	£36,060	1%	
	Swimming Pool	1571	1,841,395	1,670,622	10%	£36,363	£33,120	10%	
	Bio- Molecular Sciences Phase 1	1353	1,425,689	1,567,167	-9%	£29,352	£30,016	-2%	
(2)	Jesse Boot Conference Centre	1481	1,401,144	1,161,742	21%	£28,182	£23,117	22%	Operated by De Vere
(2)	Orchard Hotel	1681	1,359,070	1,450,184	-6%	£26,675	£26,258	2%	Operated by De Vere
	Lenton & Wortley Hall	2141	1,305,274	1,382,633	-6%	£28,055	£28,415	-1%	
	Willoughby Hall	2211	1,224,087	1,302,536	-6%	£25,391	£28,631	-11%	
	Lincoln Hall	2150	1,189,822	1,196,223	-1%	£25,297	£24,704	2%	
	Science area, MRI, etc.	1271	1,099,920	1,026,734	7%	£23,135	£21,887	6%	
	Nightingale Hall	2161	1,086,265	1,098,601	-1%	£23,099	£22,644	2%	
	Florence Boot Hall	2131	1,029,275	1,115,044	-8%	£21,913	£22,652	-3%	
	David Ross Sports Village	1221	948,733	25,741	-	£21,503	£609	-	
	Cavendish Hall	2111	913,455	820,220	11%	£18,797	£17,105	10%	
	Boots Science Building	1581	869,237	818,964	6%	£17,308	£15,819	9%	
	Ancaster Hall	2101	813,825	824,890	-1%	£17,649	£17,443	1%	
	Arts Centre & School of Music	1501	589,425	595,304	-1%	£12,569	£12,653	-1%	
	Institute of Hearing Research	1401	558,792	590,944	-5%	£11,054	£10,775	3%	
	Trent Building (part), Highfield Hou	1101	554,623	542,903	2%	£13,406	£11,940	12%	
	Portland Building Kitchen	1111	528,904	520,767	2%	£10,294	£9,436	9%	
	D.H.Lawrence Lakeside Pavilion	1631	451,903	500,600	-10%	£9,887	£10,003	-1%	
	Lenton Firs - Built Environment	1431	417,425	489,142	-15%	£10,220	£10,986	-7%	
	Wolfson Building	1421	371,569	466,836	-20%	£8,817	£9,015	-2%	
	Staff Club Lenton Mount, Hemsley	1181	371,210	337,094	10%	£8,031	£6,897	16%	
	Innovative Technology Research C	1641	339,984	330,858	3%	£7,307	£6,543	12%	
	Redcourt	2221	244,342	258,551	-5%	£5,530	£5,401	2%	
	Portland Building new extn.	1111	239,090	265,410	-10%	£5,624	£5,534	2%	
	Lenton Hurst	2411	215,395	259,554	-17%	£4,916	£5,666	-13%	
	Environmental Education Centre (H	1439	211,740	159,616	33%	£4,553	£3,134	45%	
	Cripps Health Centre	1231	209,036	213,517	-2%	£4,779	£4,555	5%	
	Manufacturing Engineering (MMME	1371	201,000	201,069	0%	£4,300	£4,117	4%	Jul estd
	Lenton Grove (History)	1211	174,274	168,609	3%	£4,086	£3,655	12%	
	Lenton Eaves (UNSSC)	1461	124,905	140,634	-11%	£3,091	£2,987	3%	
	Lenton Fields (China House)	2163	116,694	136,093	-14%	£2,945	£2,784	6%	
	Cripps Hall Kitchen	2171	102,000	114,091	-11%	£2,500	£2,466	1%	Jul estd
	Rutland Hall Extension	2195	100,335	103,876	-3%	£2,407	£2,340	3%	
	Lenton Close Annexe (Cripps Hall)	2175	97,963	86,166	14%	£2,174	£2,059	6%	
	Sustainable Research Building	1436	97,219	99,126	-2%	£2,490	£2,205	13%	
	Cavendish Hall Extension 1994 (H	2115	91,300	95,279	-4%	£2,257	£2,202	2%	
	Paton House (Built Env.)	1441	90,941	92,025	-1%	£2,278	£2,142	6%	
	Orchards	1161	90,274	95,875	-6%	£2,412	£2,319	4%	
	Sherwood Hall kitchen	2200	77,188	82,137	-6%	£1,939	£1,884	3%	
	Lenton Lodge	2251	69,215	65,319	6%	£1,888	£1,676	13%	
	Lincoln Hall Kitchen	2150	66,444	98,803	-33%	£1,856	£2,268	-18%	
	Centre for 3D Design	1223	55,696	48,886	14%	£1,446	£1,262	15%	
	Warden's House Sherwood Hall	2207	50,410	53,544	-6%	£1,364	£1,330	3%	
(2)	J.Boot C.C. Annexe (Cottage)	1482	45,404	48,227	-6%	£1,260	£1,271	-1%	
	Rutland Hall kitchen	2191	41,611	45,299	-8%	£1,295	£1,428	-9%	
	Paton Cottage (Stables Annx, Patc	1442	34,567	34,042	2%	£990	£900	10%	
	Warden's House Florence Boot Ha	2133	31,685	30,625	3%	£926	£783	18%	
	Former Warden's House, Cavendish	2113	31,122	30,285	3%	£911	£872	5%	
	Cavendish Hall kitchen	2111	30,412	36,478	-17%	£920	£1,025	-10%	
	Warden's House Rutland Hall	2194	28,166	27,061	4%	£881	£791	11%	
	Lenton Firs Lodge West	2241	28,159	33,758	-17%	£880	£918	-4%	
	Lenton & Wortley Hall kitchen	2141	24,403	32,190	-24%	£1,185	£1,358	-13%	
	5A Wortley Hall Close (Eco-House	2296	21,479	21,890	-2%	£684	£657	4%	
	Warden's House Ancaster Hall	2105	15,328	2,508	511%	£529	£197	169%	
	Humanities	1671	14,756	13,904	6%	£618	£592	4%	
	Green Close (New Eco-houses)		11,410	9,881	15%	£554	£442	25%	
	Redcourt Lodge	2222	9,796	9,235	6%	£394	£229	72%	
	Sherwood Hall Laundry	2200	6,858	7,674	-11%	£400	£287	39%	
	Temporary Sports Centre OIL	2165	0	1,304,189	-100%	£0	£43,907	-100%	Removed
	1 Nightingale Close (Nigh.Hall War	2321	0	15,217	-100%	£0	£471	-100%	Closed from May 16
	Clifton Building 1 (North) - DEMOL	1351	0	0	-	£0	£350	-	Meter removed Feb'16
	Fitness Centre, Main Campus	1221	0	-12,731	-	£0	-£157	-	
	Sports Centre, Main Campus	1221	0	-49,940	-	£0	-£627	-	
	Total of 70 accounts	Totals	60,925,388	62,818,786	-3%	£1,220,509	£1,211,403	1%	

4.C - Appendix C – Fossil Fuel Data continued

Gas Invoices		2016/17	2015/16	% change	2016/17	2015/16	% change	
Sutton Bonington		kWh	kWh	kWh	£	£	£	
Main Boilerhouse	6800	18,983,000	15,280,377	24%	£325,000	£253,974	28%	Apr-Jul estd
Plant Sciences	5711	2,010,568	2,159,280	-7%	£41,279	£40,629	2%	
Veterinary School	5721	1,999,842	1,877,251	7%	£40,064	£35,663	12%	
Bio-Energy and Brewing Science	5781	521,804	445,051	17%	£10,031	£9,680	4%	
Gateway Building (Bio-Sciences)	5771	497,106	458,705	8%	£10,788	£9,542	13%	
Gustafson Glasshouse		413,488	448,543	-8%	£10,169	£10,025	1%	
Sports Centre SB (New)	5951	210,985	275,142	-23%	£5,381	£5,944	-9%	
TCRU Future Crop Glasshouses	5445	174,574	227,393	-23%	£4,519	£4,870	-7%	
Bio-Energy BIOMASS	5781	170,989	161,178	6%	£7,409	£7,197	3%	Deliveries
The Elms (Environmental Science)	5161	139,491	101,814	37%	£3,256	£2,526	29%	
Eviton House (68 College Road)	5891	132,205	114,002	16%	£3,071	£2,773	11%	
The Firs (Surgery No.2)	5233	106,952	171,351	-38%	£3,171	£4,011	-21%	
Food Science Building HWS	5701	51,464	63,574	-19%	£1,376	£1,586	-13%	
St.Michael's Flats Nos 6&7	6842	42,952	54,423	-21%	£1,196	£1,232	-3%	
'Farm' Boilerhouse	6800	38,096	46,679	-18%	£2,892	£10,886	-73%	
St.Michael's House Flat 1	6841	33,329	27,514	21%	£897	£672	33%	
Food Hall	5081	25,349	61,305	-59%	£1,030	£1,329	-22%	
Bonington Hall Warden's House	5842	25,146	14,686	71%	£792	£794	0%	
Bonington Hall Laundry & Gym	5881	24,335	35,287	-31%	£835	£1,001	-17%	
St.Michael's House Flat 2	6841	21,757	23,429	-7%	£691	£674	3%	
24 College Road	6805	18,562	48,141	-61%	£810	£967	-16%	
52 College Road	6820	18,441	17,736	4%	£667	£563	19%	
St.Michael's House Flat 3	6841	14,380	17,201	-16%	£522	£434	20%	
St.Michael's House Flat 5	6841	13,042	14,982	-13%	£494	£416	19%	
St.Michael's House Flat 4	6841	10,685	32,110	-67%	£568	£745	-24%	
St.Michael's Flats Nos 8&9	6843	4,110	14,075	-71%	£328	£367	-11%	
North Laboratory	5091	223	794	-72%	£270	£157	71%	
South Laboratory	5051	124	149	-17%	£254	£113	124%	
Main Building (Sutton Bonington)	5011	0	0	-	£1,306	£878	49%	
Sports Hall Sutton Bonington (Old)	5221	0	0	-	£262	£138	90%	
Total of 30 accounts	Totals	25,703,000	22,192,172	16%	£479,328	£409,787	17%	
Gas Invoices		2016/17	2015/16	% change	2016/17	2015/16	% change	
Jubilee Campus		kWh	kWh	kWh	£	£	£	
(2) Jubilee Conference Centre (NCSL)	7211	1,431,869	0	-	£30,570	£0	-	New acquisition
Newark Hall	7130	1,214,789	1,133,015	7%	£25,389	£22,593	12%	
GSK Sustainable Chem. BIOFUEL	7430	907,786	0	-	£84,664	£0	-	Deliveries
Computer Sciences (DCS) & The A	7040	786,578	677,589	16%	£17,221	£14,426	19%	
The Exchange (CTF)	7030	664,299	648,566	2%	£14,680	£13,422	9%	
Southwell Hall	7120	599,803	551,637	9%	£12,761	£11,441	12%	
Business School South (New)	7080	580,541	536,318	8%	£12,367	£10,520	18%	
Energy Technologies Building	7360	551,700	522,420	6%	£11,327	£9,798	16%	
Melton Hall	7110	517,287	571,024	-9%	£11,383	£11,491	-1%	
YANG Fujia Building (International)	7320	464,384	457,925	1%	£10,162	£8,265	23%	
Dearing Building (FOE)	7050	457,997	449,514	2%	£10,583	£9,765	8%	
Business School North (SMF)	7020	400,652	337,787	19%	£9,220	£7,267	27%	
(1) Sir Colin Campbell Building (Gatew	7340	381,662	287,177	33%	£7,472	£5,800	29%	
Jubilee Sports Centre	7301	324,554	339,669	-4%	£7,913	£8,332	-5%	
(1) Romax Building	7390	320,961	335,080	-4%	£7,470	£7,011	7%	
(1) Institute of Mental Health	7370	277,466	310,875	-11%	£6,263	£6,326	-1%	
Aerospace Technologies Building	7380	277,466	252,972	10%	£6,105	£5,131	19%	
The Atrium Catering	7040	228,291	459,456	-50%	£6,741	£9,156	-26%	
The Amenities Building (Xu Yafen)	7330	156,057	319,014	-51%	£4,302	£6,311	-32%	
Imperial Tobacco Site	7460	143,528	9,983	-	£3,551	£316	-	
Ingenuity Centre (TEC Building)	7440	125,100	14,262	-	£5,202	£790	-	
The Nottingham Geospatial Buildin	7350	84,907	91,449	-7%	£2,194	£1,915	15%	
Geospatial BIOMASS	7350	74,654	71,220	5%	£3,395	£3,330	2%	
Si Yuan Centre For Chinese Studie	7410	50,135	43,561	15%	£1,367	£1,332	3%	
Gatehouse Lodge	7470	35,098	46,572	-25%	£907	£2,824	-68%	
Starbucks Cafe Jubilee		28,134	26,005	8%	£818	£711	15%	
Energy Technologies Bldg BIOFUEL	7360	0	75,000	-100%	£0	£8,000	-100%	Deliveries
(1) 6 Triumph Rd (ex Dairy Crest, opp 9 Trium		0	44,694	-100%	£0	£1,147	-100%	
Woolpack House (ex Romserve /	7480	0	63	-	£426	£272	-	
(1) Sir Colin Campbell Building (Gatew	7340	0	-13,777	-	£328	£312	-	
Total of 29 items		11,085,695	8,599,069	29%	£314,780	£188,003	67%	
Gas Invoices		2016/17	2015/16	% change	2016/17	2015/16	% change	
Others		kWh	kWh	kWh	£	£	£	
King's Meadow Campus	6901	4,683,394	5,363,441	-13%	£97,752	£102,560	-5%	
Derby Medical School	3561	1,663,458	1,642,527	1%	£34,404	£32,044	7%	
Clinical Sciences (City Hospital) Ph	3325	676,603	673,500	0%	£16,000	£15,349	4%	Costs estd
Riverside Sports (Grove Farm)	6122	344,155	100,608	242%	£6,937	£2,143	224%	First full year
Highfields Sports Ground	6311	145,790	156,768	-7%	£3,562	£3,396	5%	
Clinical Sciences (City Hospital) Ph	3325	130,115	112,121	16%	£3,000	£2,555	17%	Costs estd
Vaughan Parry Williams Pavilion	6314	82,440	100,459	-18%	£2,380	£2,509	-5%	
Grove Farm OIL		33,241	121,141	-73%	£1,481	£3,899	-62%	
Unit 4, Easter Park	6931	21,742	50,882	-57%	£954	£1,505	-37%	
Boathouse KEROSENE		9,988	28,251	-65%	£355	£641	-45%	
522 Derby Road (ex. Mansells)	7420	0	0	-	£0	£41	-100%	
Total of 12 accounts		7,790,926	8,349,697	-7%	£166,824	£166,642	0%	
Steam Used		2016/17	2015/16	% change	2016/17	2015/16	% change	
Medical School		kWh	kWh	kWh	£	£	£	
Medical School		9,783,510	14,573,690	-33%	£460,000	£653,972	-30%	Costs estd
Embedded Units (Q.M.C.)		3,700,000	3,659,519	1%	£0	£14,445	-100%	Estsd
		13,483,510	18,233,209	-26%	£460,000	£668,417	-31%	

4.D - Appendix D – Water Data

Water Invoices		2016/17	2015/16	% change	2016/17	2015/16	% change		
Main Campus		cubic m.	cubic m.	cubic m.	£	£	£		
	Main meter, South entrance	1000	443,000	473,980	-7%	£0	£0	-	Jul estd
(2)	Orchard Hotel	1681	7,000	13,886	-50%	£0	£0	-	Jul estd
	Nightingale Hall	2161	6,500	9,320	-30%	£0	£0	-	Jul estd
(2)	Jesse Boot Conference Centre	1481	1,200	1,101	9%	£0	£0	-	Jul estd
	Lenton Eaves (UNSSC)	1461	950	973	-2%	£0	£0	-	Jul estd
	Lenton Lodge	2251	600	62	863%	£0	£0	-	Jul estd
	Lenton Grove (History)	1211	590	1,119	-47%	£0	£0	-	Jul estd
	Lenton Hurst	2411	500	538	-7%	£0	£0	-	Jul estd
	Paton House (Built Env.)	1441	450	402	12%	£0	£0	-	Jul estd
	Redcourt	2221	420	343	23%	£0	£0	-	Jul estd
	Lenton Firs - Built Environment	1431	380	324	17%	£0	£0	-	Jul estd
(2)	JBCC Banqueting Rooms	1481	300	2,717	-89%	£0	£0	-	Jul estd
	5A Wortley Hall Close (Eco-House)	2296	65	91	-29%	£0	£0	-	Jul estd
	Water & SWD charges	1000	0	0	-	£440,000	£504,109	-13%	Jul estd
	TE & sewerage charges	1000	0	0	-	£450,000	£357,404	26%	Mar – Jul estd
Total of 15 accounts		Totals	461,955	504,856	-8%	£890,000	£861,513	3%	
Water Invoices		2016/17	2015/16	% change	2016/17	2015/16	% change		
Sutton Bonington		cubic m.	cubic m.	cubic m.	£	£	£		
	Landcroft Lane meter	6800	202,000	198,019	2%	£0	£0	-	Apr-Jul estd
	College Road meter	6800	19,000	17,347	10%	£0	£0	-	Apr-Jul estd
	St.Michael's House (Flats 1-5)	6841	2,188	2,078	5%	£5,536	£5,078	9%	
	Bunny Park Farm	6860	350	300	17%	£435	£450	-3%	May-Jul estd
	Trough, Kegworth Road	6910	0	0	-	£50	£39	29%	
	SB water charges	6800	0	0	-	£195,000	£181,252	8%	Apr-Jul estd
	SB TE & sewerage charges	6800	0	0	-	£185,000	£189,130	-2%	Mar-Jul estd
Total of 7 items		223,538	217,745	3%	£386,022	£375,948	3%		
Water Invoices		2016/17	2015/16	% change	2016/17	2015/16	% change		
Jubilee Campus		cubic m.	cubic m.	cubic m.	£	£	£		
	Jubilee Campus main meter	7000	34,956	36,163	-3%	£0	£0	-	
(1)	Jubilee Campus ETB/IMH/ATC/Ror	7000	14,612	9,373	56%	£0	£0	-	
	Southwell Hall	7120	7,504	8,071	-7%	£0	£0	-	
	Jubilee Sports Centre	7301	3,373	3,991	-15%	£0	£0	-	
	The Amenities Building (Xu Yafen)	7330	2,893	2,619	10%	£0	£0	-	
	The Nottingham Geospatial Building	7350	2,169	1,704	27%	£0	£0	-	
	Yang Fulia Building (International H	7320	1,295	759	71%	£0	£0	-	
	Newark Hall	7130	1,181	2,994	-61%	£0	£0	-	
(1)	Sir Colin Campbell Building (Gatew	7340	1,110	1,347	-18%	£0	£0	-	
	Gatehouse Lodge	7470	700	92	661%	£548	£450	22%	May-Jul estd
	Bonded Warehouses (Imperial Tot	7460	604	0	-	£18,958	£0	-	
(1)	9 Triumph Road (ex Dairy Crest Si		410	4,328	-91%	£0	£0	-	Jul estd
	Bonded Warehouses (Imperial Tot	7460	113	0	-	£329	£0	-	
(1)	6 Triumph Rd (ex Dairy Crest, opp		20	166	-88%	£570	£867	-34%	Jul estd
	Charnock Ave Sports Pavilion	7201	0	0	-	£80	£41	97%	Dec-Jul estd
(1)	9 Triumph Road costs inc SWD		0	0	-	£9,500	£19,180	-50%	Jul estd
	Jubilee Campus costs inc SWD	7000	0	0	-	£189,257	£182,452	4%	
Total of 17 items		70,940	71,607	-1%	£219,243	£202,990	8%		
Water Invoices		2016/17	2015/16	% change	2016/17	2015/16	% change		
Others		cubic m.	cubic m.	cubic m.	£	£	£		
	King's Meadow Campus	6901	9,668	13,316	-27%	£43,000	£57,021	-25%	Costs estd Apr-Jul
	Clinical Sciences (City Hospital) Ph	3325	6,056	5,228	16%	£22,000	£19,291	14%	Costs estd
	Grove Farm - Changing Rooms	6122	3,700	0	-	£5,800	£52	-	Jul estd
	Boat House	6321	1,768	1,612	10%	£4,419	£3,932	12%	
	Highfields Sports Ground	6311	727	1,415	-49%	£1,888	£3,461	-45%	
	Clinical Sciences (City Hospital) Ph	3325	51	64	-20%	£180	£236	-24%	Costs estd
	Unit 4, Easter Park	6931	36	218	-83%	£2,119	£2,638	-20%	
	522 Derby Road (ex. Mansells)	7420	0	393	-100%	£0	£1,005	-100%	Demolished
Total of 8 items		22,006	22,246	-1%	£79,406	£87,636	-9%		
Water Recharges		2016/17	2015/16	% change	2016/17	2015/16	% change		
Medical School		cubic m.	cubic m.	cubic m.	£	£	£		
	Medical School		24,000	39,802	-40%	£44,000	£70,665	-38%	Costs estd
	Embedded Units		2,900	2,868	1%	£24,000	£28,692	-16%	Costs estd
Total of 2 items		26,900	42,670	-37%	£68,000	£99,357	-32%		



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