



The University of
Nottingham
Estates



Energy Annual Report 2008/09



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Executive Summary

The headline performance indicators from this year's report are as follows: -

Energy

Overall energy consumption (at 198.1GWh) decreased by 1% in 2008/9, reversing last year's upward move. However, if the effect of the continued cooler weather and the increase in floor area (up 2%) are considered, then a final consumption of 209.3GWh could have been expected. In the Medical School, historically an energy-intensive building, fossil fuel consumption decreased by 15% as a result of energy-saving projects there, on top of a 9% reduction last year.

Water

Total water consumption was reduced by 9% to 678,400 cubic metres. Total water consumption was as high as 925,600 cubic metres back in 2004/5, 36% above the current level.

Costs

Overall utility costs increased again in 2008/9, to a new high of £11.38 million (including taxes) – a rise of 5% on the 2007/8 figure. However, this was actually a very good performance, as world energy prices reached record highs in Autumn 2008. Our purchasing strategy of buying gas and electricity monthly allowed us to defer the purchase of much of our energy until prices had fallen in 2009.

Environmental

Overall emissions of carbon dioxide from all energy sources fell for the third year running, down by 3% overall due to reductions in energy consumption. The University has continued to purchase 'green' electricity from renewable sources, which has saved some 35,520 tonnes of carbon dioxide compared to 'non-green' electricity supplies.

Premises

The overall premises Gross Internal Area (GIA) has increased by 2% compared to 07/08. The major new-build addition was three new buildings at Jubilee Campus; The Sir Colin Campbell Building, International House, and the Amenities Building which all use energy-efficient heat pumps to provide heating and cooling from the Jubilee Lake, with no conventional gas boilers.

Introduction

The strategic management of energy is undertaken by the Environment Committee, and supported by an Energy sub-Group. The membership of the energy sub-Group for 2008/9 was as follows: -

Chris Jagger	Director of Estates
Tim Rudge	Energy Management Engineer
Mark Bonsall	Senior Engineer
Andrew Bryers	Asst. Energy and Environmental Manager
Deborah Kettley	Senior Management Accountant
Gavin Scott	Environmental Manager
Stephen Pickering	Associate Professor & Reader in Mechanical Engineering, School of 3M
Robin Wilson	Associate Professor, School of Built Environment
Jason Yarnall	BMS/Controls Engineer
Matt Butcher	Student Union Environment and Social Justice Rep.

The annual energy report is produced to provide statistical information over a rolling three-year period. The data includes all of the University's UK building stock, non-residential and residential, with the exception of student houses not located within our campuses.

It concentrates on three sections; the content in broad terms is:

Section 1 – Total Energy Report

Covering total energy costs by campus, floor area (square metres), and full-time student numbers set against the total University turnover.

Section 2 – Analysis of Energy Components

Covering the analysis of electricity, fossil fuels (gas and fuel oil) and water consumption and costs associated directly with the consumption.

Section 3 – Environmental Considerations

Covering carbon dioxide emissions and how the climatic conditions in the East Midlands and weather data affect the required heating load for the University.

Note that most figures relate to the University's financial year of August 1st 2008 to July 31st 2009, with the baseline for comparison being the previous (2007/8) financial year. Utilities continue to be procured via Notice Ltd, which is a wholly owned subsidiary of the University of Nottingham

Section 1 – Total Energy Report

1.A. - Energy and Water Costs Summary

Energy and water costs increased again, to a new high of £10.2 million in 2008/9. This was a rise of 5% on the 2007/8 figure. As explained in sections 2.B and 2.D, this was actually a very good performance, as world energy prices reached record highs in the Autumn of 2008.

Our purchasing strategy of buying gas and electricity monthly allowed us to defer the purchase of much of our energy until prices had fallen in 2009. This left us with a relatively modest increase in costs, whereas many energy users on conventional annual energy contracts saw their costs rise by over 50% compared to the previous year.

Energy and Water Costs				Change
	2006/7	2007/8	2008/9	'07/8 to '08/9
University Park	£ 3,844,450	£ 5,545,621	£ 5,800,298	5%
Sutton Bonington	£ 960,900	£ 1,416,933	£ 1,471,426	4%
Jubilee Campus	£ 513,198	£ 703,870	£ 812,197	15%
Others	£ 465,405	£ 641,467	£ 688,071	7%
Medical School	£ 1,055,068	£ 1,414,542	£ 1,439,585	2%
Total	£ 6,839,021	£ 9,722,433	£10,211,576	5%

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

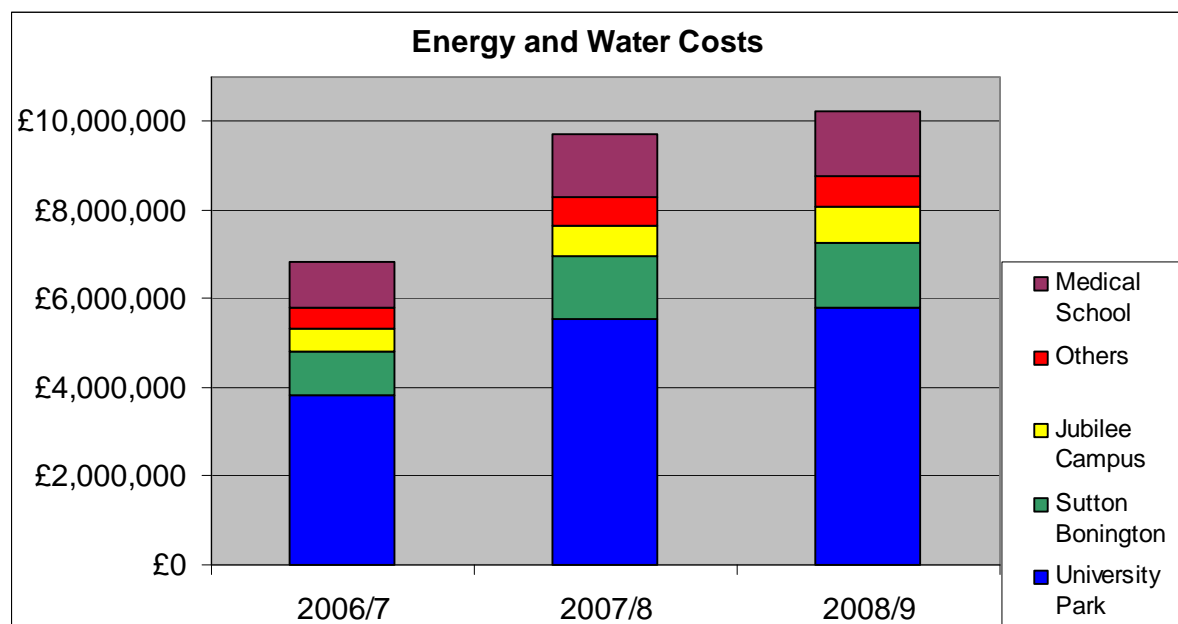


Figure 1.A.2 Graph of energy and water costs for the last 3 years split by campus.

Note that these figures exclude VAT and Climate Change Levy, which are discussed on page 5.

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

Campus Costs	Cost/sq.m/annum				
	Floor Area	Electricity	Heating	Water	Total
University Park	310,823	£12.25	£4.55	£1.86	£18.66
Sutton Bonington	55,086	£17.15	£5.87	£3.69	£26.71
Jubilee Campus	54,109	£9.60	£2.27	£3.14	£15.01
Others	40,451	£11.49	£4.31	£1.21	£17.01
Medical School	50,188	£13.14	£13.99	£1.55	£28.68
Total	510,657	£12.52	£5.36	£2.11	£20.00

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

The overall floor area increased by 2.0% from 2007/8, all of it at the Jubilee Campus.

Note that Jubilee Campus has 25% lower costs per square metre than the average; this is because of the highly energy efficient design of the modern buildings there. The highest costs are at the Medical School, due to the relatively poor thermal efficiency of the heating and cooling systems, the high steam costs within the NHS Trust service charges, and the unusual building construction with large voids between floors. Energy efficiency efforts have been concentrated at the Medical School resulting in a 10% reduction in total energy consumption over three years.

Note that if taxes (VAT and CCL, see below) are taken into account, our average utility costs are now £22.28 per square metre per annum.

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

VAT costs on energy were £1,075,000 in 1998/9, and CCL paid by Notice Ltd during 2008/9 was £94,000, almost all of it for gas. This is because almost all of our electricity is 'green' and so is exempt from CCL.

The majority of tables in this report do not include VAT.

The Climate Change Levy (CCL) was introduced in April 2001. As of April 1st 2009 the rates were 0.164p/kWh on gas and 0.470p/kWh on the electricity costs of all non-residential properties, although 'green' electricity is exempt.

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

	2008/9				2007/8
	Electricity	Fossil Fuels	Water	Totals	Totals
Energy Costs	£ 6,395,694	£ 2,736,501	£ 1,079,381	£ 10,211,576	£9,722,433
Climate Change Levy	£ 2,851	£ 90,899	-	£ 93,750	£92,988
Value Added Tax	£ 694,054	£ 380,542	-	£ 1,074,596	£1,023,292
Total	£ 7,092,599	£ 3,207,942	£ 1,079,381	£ 11,379,922	£10,838,713

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

1.D - 2008/2009 Costs Broken Down by Campus and Utilities

Energy and Water Costs	Electricity	Fossil Fuels	Water	Total
University Park	£ 3,807,325	£ 1,413,980	£ 578,993	£ 5,800,298
Sutton Bonington	£ 944,564	£ 323,372	£ 203,490	£ 1,471,426
Jubilee Campus	£ 519,428	£ 122,771	£ 169,998	£ 812,197
Others	£ 464,792	£ 174,378	£ 48,901	£ 688,071
Medical School	£ 659,585	£ 702,000	£ 78,000	£ 1,439,585
Total	£ 6,395,694	£ 2,736,501	£ 1,079,381	£ 10,211,576

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

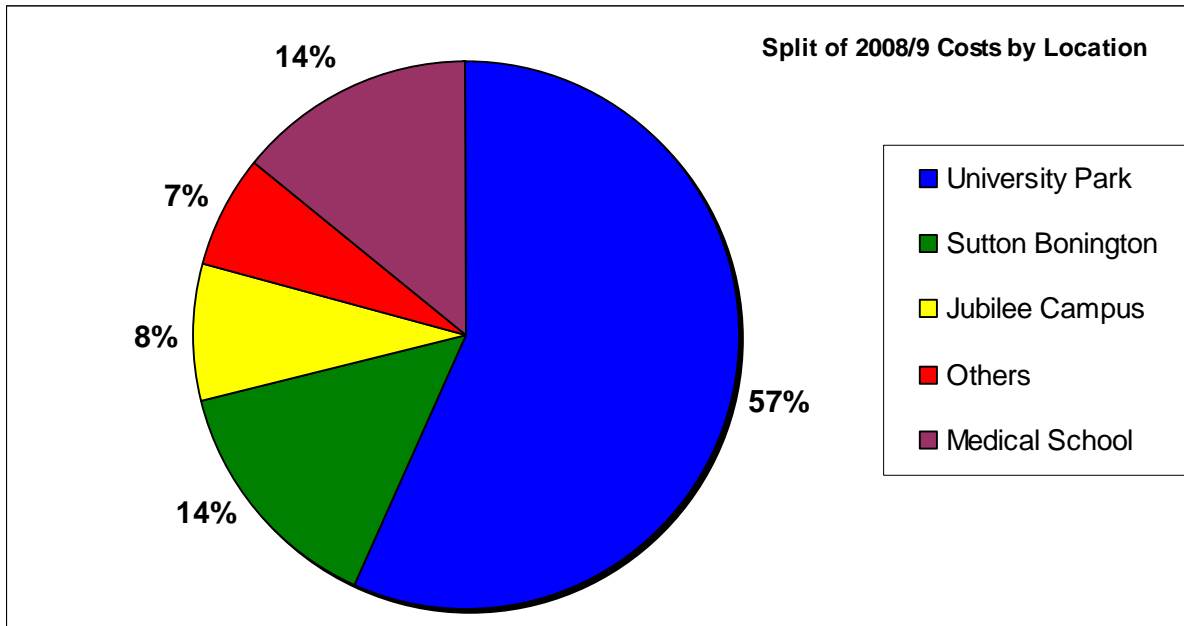


Figure 1.D.2 Chart of energy and water costs split by campus

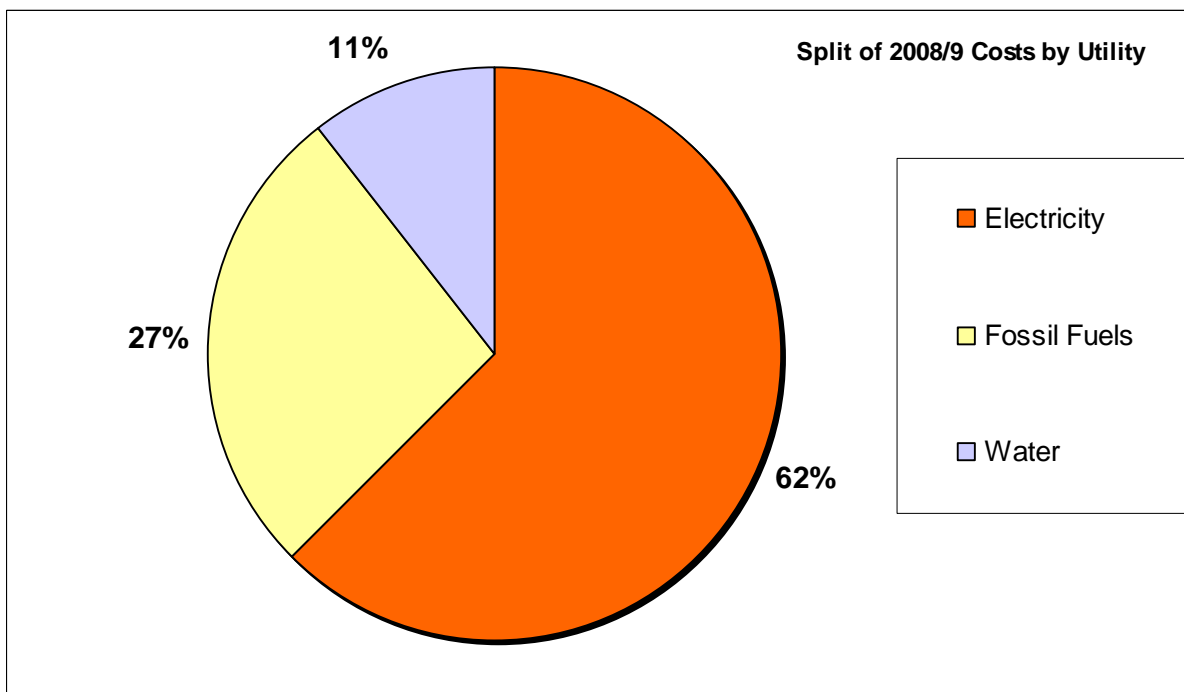


Figure 1.D.3 Chart of energy and water costs split by utility type

1.E - Energy Use Summary

Overall energy consumption of 198.1GWh decreased by 1% in 2008/9, reversing last year's upward move. However, if the effect of the continued cooler weather (see section 3.C) and the increase in floor area (up 2%) are considered, then a final consumption of 209.3GWh could have been expected, so savings of 5.6% were achieved in a like-for-like comparison.

Electrical usage remains particularly difficult to bring under control, but has now stabilised and there are signs that a modest downward trend began in early 2009.

The Jubilee Campus showed an increase due to the three additional new buildings occupied from September 2008. Further reductions were made at the Medical School as a result of energy-reduction projects ongoing in 2008/9.

Halls of residence now account for 20.0% of our fossil fuel usage and 8.4% of our electrical usage. In the Halls, both gas and electricity consumption increased in 2008/9 compared to 2007/8 by 3.3% and 6.4% respectively, which more closely reflect the increases expected from the weather.

Energy Consumption	MWh 2006/7	MWh 2007/8	MWh 2008/9	Change '07/8 to '08/9
University Park	102,232	111,718	114,187	2%
Sutton Bonington	26,000	28,605	26,702	-7%
Jubilee Campus	9,553	10,742	12,079	12%
Others	10,607	11,812	12,450	5%
Medical School	35,738	36,403	32,671	-10%
Total	184,130	199,279	198,088	-1%

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

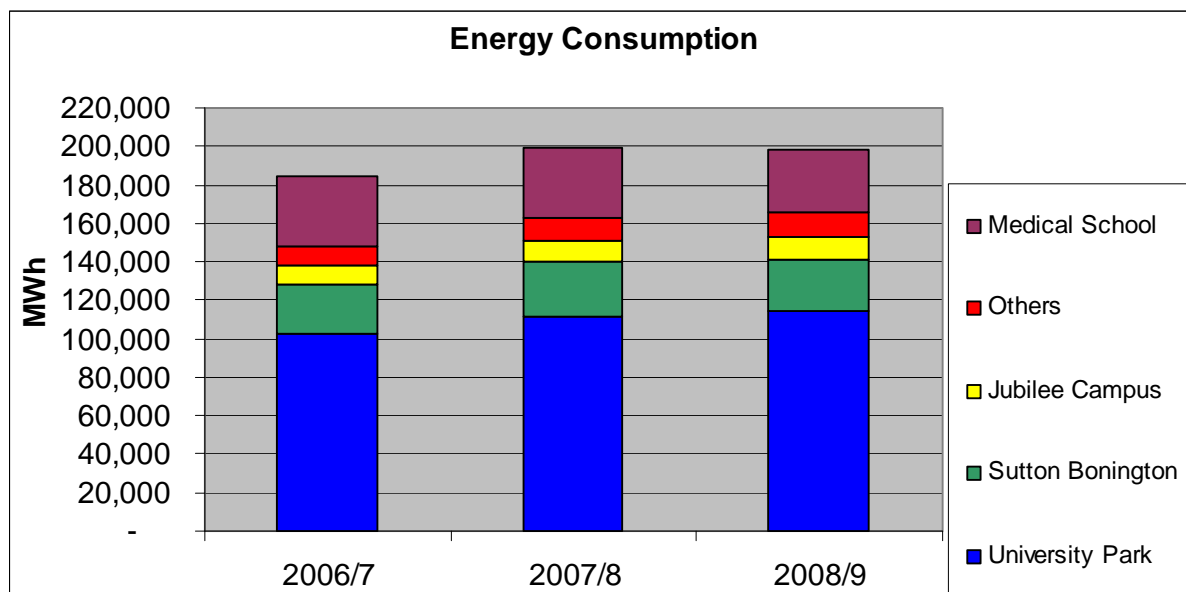


Figure 1.E.2 Graph of energy consumption for the last 3 years split by campus

1.F - Energy Use Breakdown by Campus and Utilities

Energy Consumption 2008/2009	MWh	MWh	MWh
	Electricity	Fossil Fuels	Total
University Park	46,862	67,324	114,187
Sutton Bonington	11,229	15,473	26,702
Jubilee Campus	6,447	5,632	12,079
Others	5,291	7,159	12,450
Medical School	9,571	23,100	32,671
Total	79,401	118,688	198,088

Figure 1.F.1 Table of energy consumption for 2005/6 split by campus and by utility

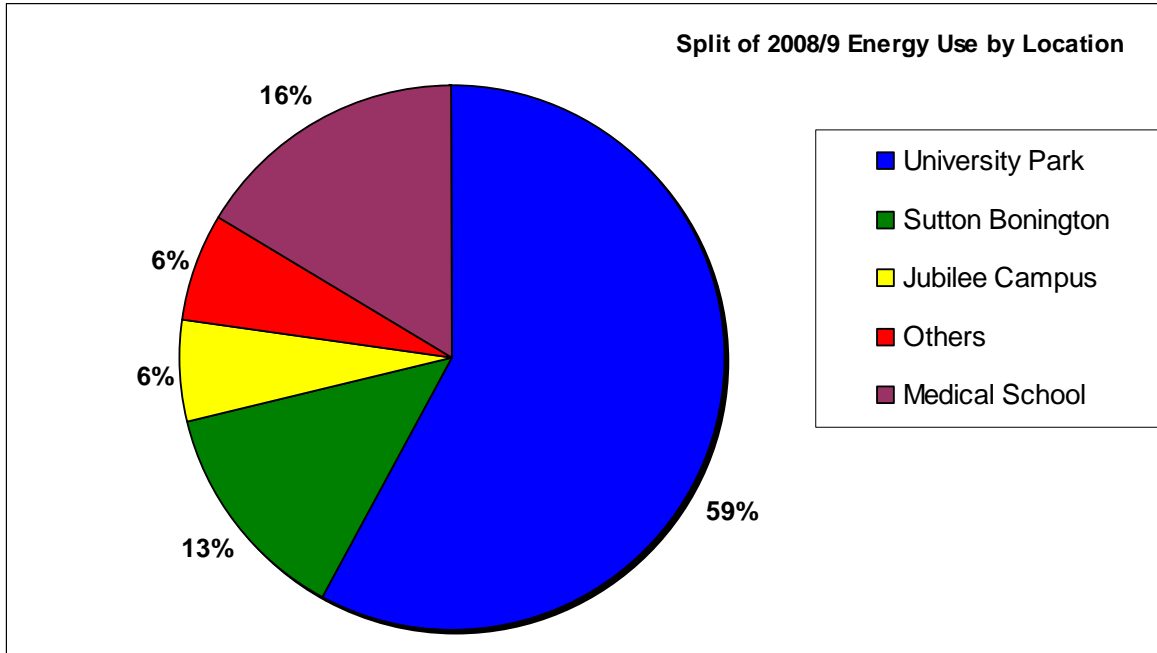


Figure 1.F.2 Pie chart of energy consumption split by campus

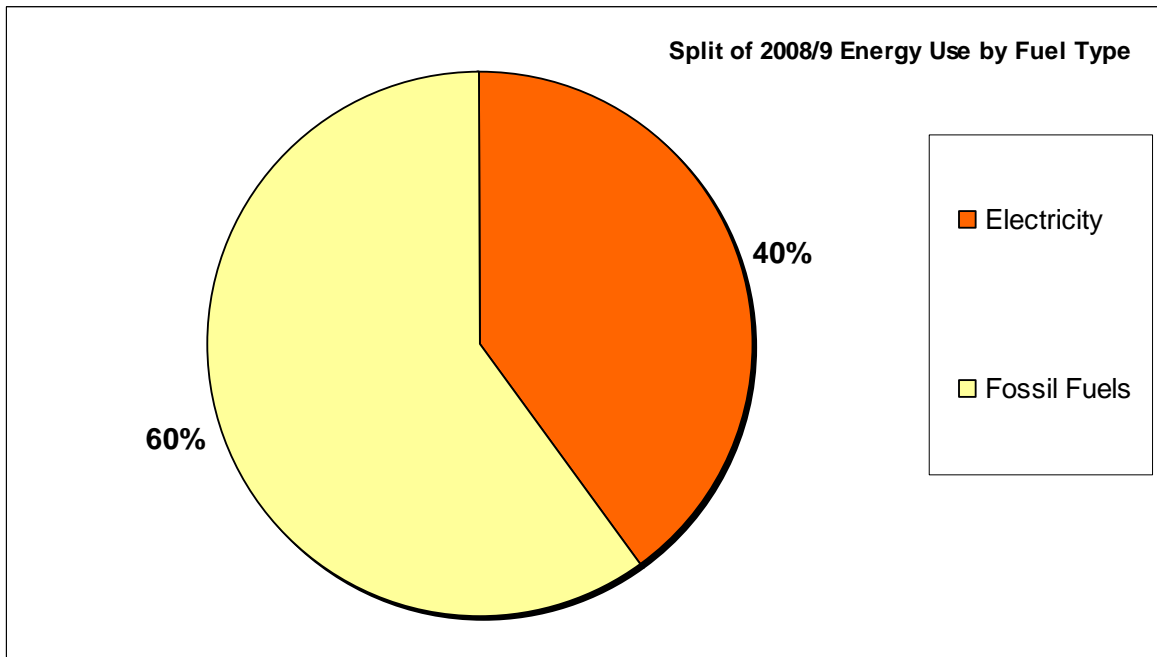


Figure 1.F.3 Pie chart of energy consumption split by utility type.

Note: Our 'fossil fuels' comprise 99.5% gas and 0.5% gasoil

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

	2005/6	2006/7	2007/8	2008/9	Change
Floor Area (sq.m.)	482,144	498,088	502,943	510,657	1.5%
Annual Energy Usage (MWh)	191,905	184,130	199,279	198,088	-0.6%
Energy Usage Per sq. m.	398	370	396	388	-2.1%

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

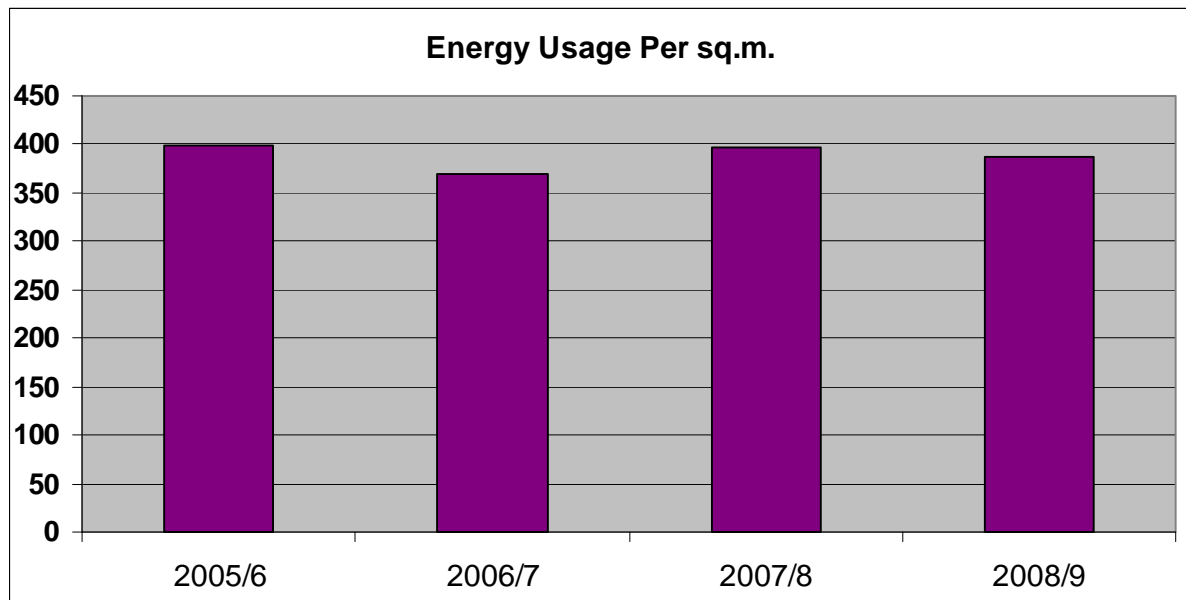


Figure 1.G.2 Graph of last four years energy usage per unit floor area.

Note that there is no correction for weather in these figures, and the last two years have been markedly cooler than other recent years.

	2005/6	2006/7	2007/8	2008/9	Change
Floor Area (sq.m.)	482,144	498,088	502,943	510,657	1.5%
Energy and Water Costs	£ 8,241,624	£ 6,839,021	£ 9,722,433	£10,211,576	5.0%
Utility Cost Per sq. m.	£ 17.09	£ 13.73	£ 19.33	£ 20.00	3.4%

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

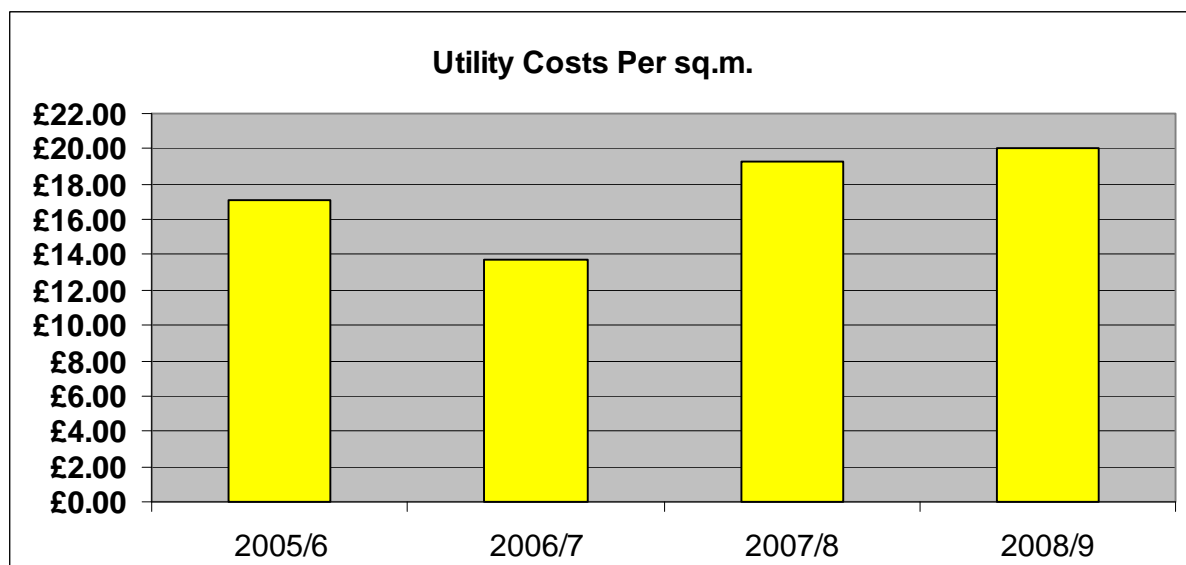


Figure 1.G.4 Graph of last four years energy and water costs normalised by floor area.

1.H - Energy Usage and Cost per FT Student

	2005/6	2006/7	2007/8	2008/9	'07/8 to '08/9
FT Student Numbers	23,800	23,500	24,770	25,550	3.1%
Annual Energy (MWh)	191,905	184,130	199,279	198,088	-0.6%
Energy / Student (kWh)	8,063	7,835	8,045	7,753	-3.6%

Figure 1.H.1 Table of last four years energy usage and full-time student numbers.

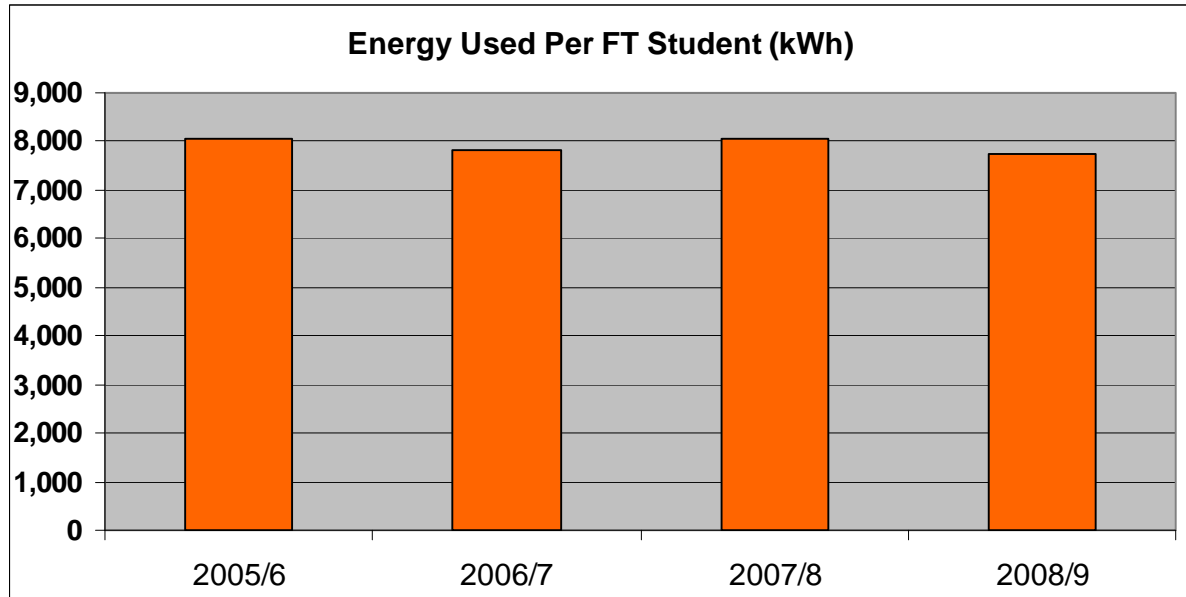


Figure 1.H.2 Graph of last four years energy usage per full-time student.

	2005/6	2006/7	2007/8	2008/9	'07/8 to '08/9
FT Student Numbers	23,800	23,500	24,770	25,550	3.1%
Energy and Water Costs	£ 8,241,624	£ 6,839,021	£ 9,722,433	£ 10,211,576	5.0%
Utility Costs / Student	£ 346.29	£ 291.02	£ 392.51	£ 399.67	1.8%

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

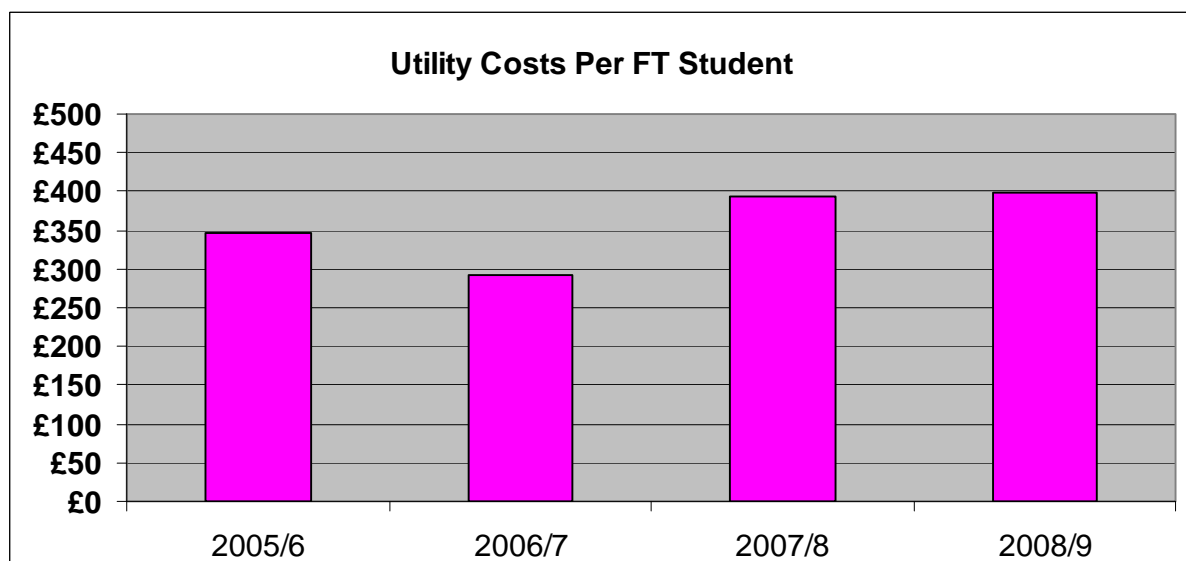


Figure 1.H.4 Graph of last four years energy and water costs per full-time student.

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

1.1 - Utility Costs as a Proportion of University Turnover

Percentage of Turnover (£ 000)	2005/6	2006/7	2007/8	2008/9	Change '07/8 to '08/9
Utility Costs inc. taxes	£ 9,465	£ 7,549	£ 10,839	£ 11,380	5.0%
Total University Turnover	£ 353,944	£ 383,351	£ 409,354	£ 448,700	9.6%
Percentage	2.67%	1.97%	2.65%	2.54%	-4.2%

Figure 1.1.1 Table of last four years energy and water costs (including taxes) and total University turnover.

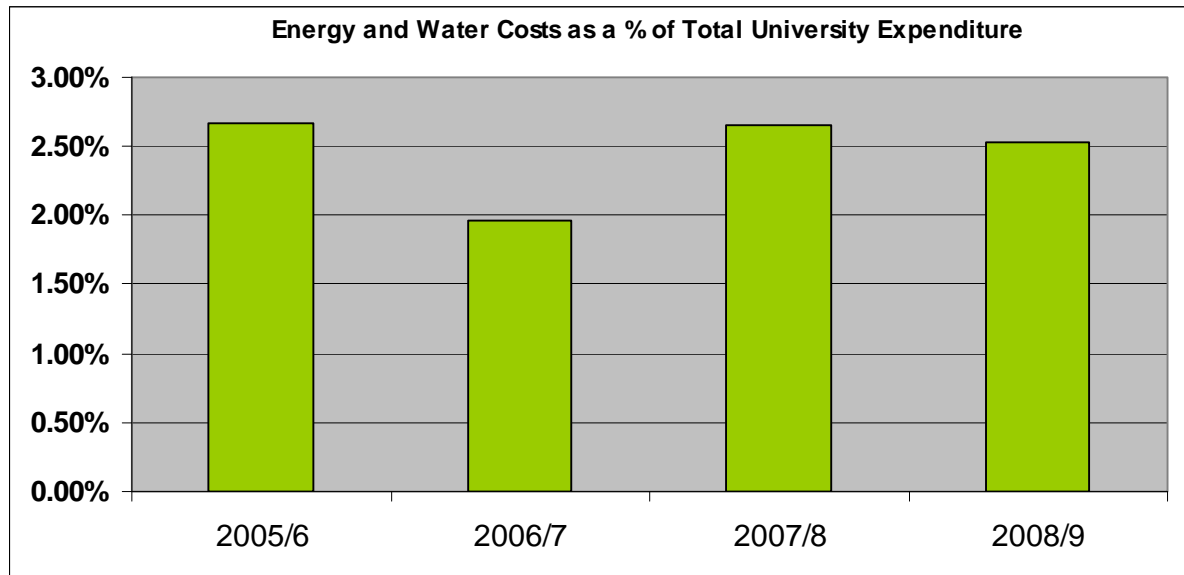


Figure 1.1.2 Graph of last four years energy and water costs normalised by total University turnover.

Note that the low figure for 2006/7 in this graph and in 1.G (Utility Costs per sq.m. on page 9) are due to the relatively low energy prices obtained in that year. Looking at a longer time frame, 2006/7 was actually more typical of 'normal' historical energy prices, and the other three years are unusually high.

1.J – Comparison to Russell Group Universities – 2007/8

	Energy use/ student (kWh)	Energy/sq.m (kWh/sq.m GIA) non- residential
Imperial College	14,265	405
Oxford	8,944	387
Cambridge	8,912	312
Birmingham	7,440	468
Edinburgh	7,061	297
Liverpool	6,963	333
Warwick	6,745	442
King's College London	6,415	376
U.C.L.	6,092	338
Newcastle Upon Tyne	5,816	342
Nottingham	5,616	376
Bristol	5,532	399
Southampton	5,499	455
Glasgow	5,425	362
Leeds	5,112	367
Manchester	5,095	296
Sheffield	4,118	285
Queen's University Belfast	3,207	264
L.S.E	3,013	278
Cardiff	2,851	238

Figure 1.J.1 Table of Estates Management Statistics for the 2007/8 financial year.

The statistics in table 1.J.1 provide a range of comparators for non-residential premises to other major Universities, as reported in the EMS returns for 2007/8. Note that this is the most recent year where data is available for comparison, but is one year behind the most recent information presented elsewhere in this report.

Section 2 – Analysis of Energy Components

2.A - Electricity Consumption

This year showed an improved performance with consumption rising 2%, in line with the growth in floor area. The new buildings built at Jubilee Campus increased area (GIA) by 22%, and are heated by lake-source heat pumps, which require electricity to drive the pumps. This is the main reason for the increase seen at the Jubilee Campus.

The Medical School saw a reduction of 7% due to improved control of the corridor ventilation systems. King's Meadow Campus – reported within 'others' showed a 10% increase as usage of the site continues to grow. A project is underway (November 2009) to reduce air-conditioning load at the data-centre there to help reduce that site's consumption.

Electricity Consumption	MWh	MWh	MWh	Change	Floor Area (m2)
	2006/7	2007/8	2008/9	'07/8 to '08/9	
University Park	43,784	46,046	46,862	2%	310,823
Sutton Bonington	10,536	11,073	11,229	1%	55,086
Jubilee Campus	5,047	5,279	6,447	22%	54,109
Others	4,727	5,148	5,291	3%	40,451
Medical School	10,328	10,121	9,571	-5%	50,188
Total	74,422	77,667	79,401	2%	

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

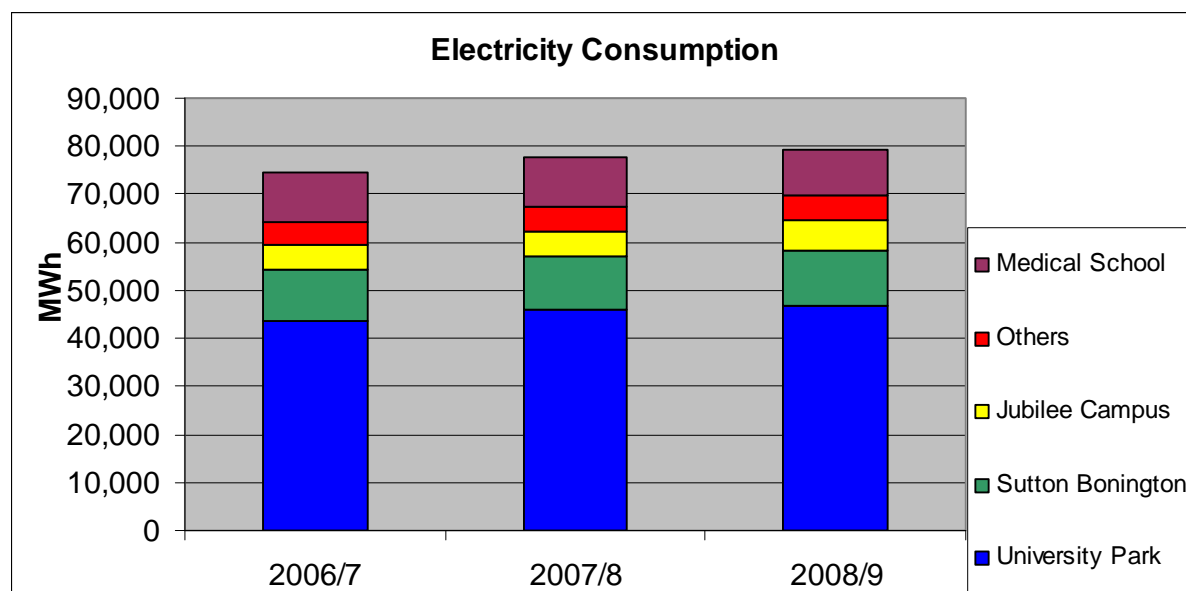


Figure 2.A.2 Graph of electricity usage for the last 3 years split by campus.

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

2.B - Electricity Costs

The University continued with the flexible purchasing policy first adopted in October 2005, meaning that energy for the main sites was bought monthly rather than annually. Electricity prices rose strongly throughout 2008 until October; they then fell until February 2009 as the recession spread. The net effect of this was that consumers fixing traditional annual contracts in September 2008 for October 2008 would have locked in at record high prices. For instance electricity for November 2008 peaked at 17.1p/kWh in early October, but we paid 11.4p/kWh by the end of that month. Similarly, January 09 was priced at 13.1p/kWh and we finally paid 7.1p/kWh, and March was 11.0p/kWh, but we paid just 6.2p/kWh when we bought our power for that month in February 2009.

As a result, costs were up only 9% on the sites on our 'half hourly' contract, whereas many consumers on fixed contracts will have seen annual prices rise by over 50%.

The tender for the University's 'sub-100kW' sites (representing 36 smaller properties, such as sports grounds) was awarded to Southern Electric commencing April 1st 2009 for two years. All of the sites were priced individually, but unit rates are typically about 9.0p/kWh for day units and 5.5p/kWh for night units.

Electricity Costs				Change
	2006/7	2007/8	2008/9	'07/8 to '08/9
University Park	£ 2,278,818	£ 3,506,636	£ 3,807,325	9%
Sutton Bonington	£ 564,816	£ 866,220	£ 944,564	9%
Jubilee Campus	£ 280,469	£ 414,014	£ 519,428	25%
Others	£ 305,536	£ 453,064	£ 464,792	3%
Medical School	£ 572,510	£ 567,495	£ 659,585	16%
Total	£ 4,002,149	£ 5,807,429	£ 6,395,694	10%

Figure 2.B.1 Table of electricity costs for the last 3 years split by campus.

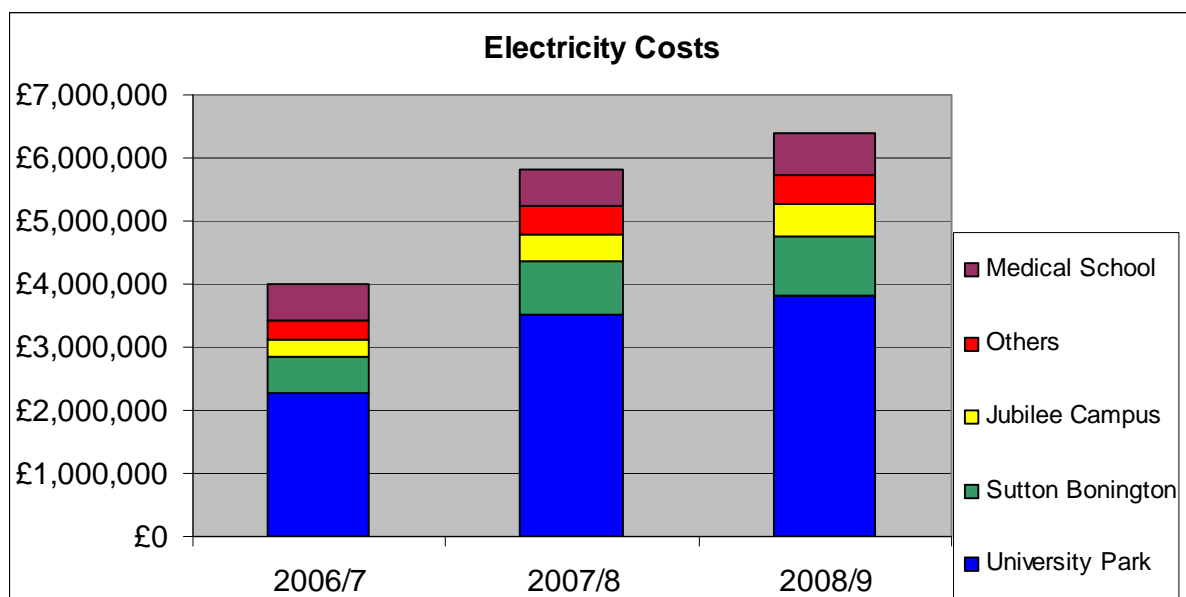


Figure 2.B.2 Graph of electricity costs for the last 3 years split by campus.

2.C - Fossil Fuel Consumption

Consumption of fossil fuels fell by 2% in 2008/9. This was actually a good performance as 2008/9 was even colder than 2007/8 (see section 3.C); the decrease in temperature indicated that an increase in gas consumption averaging 5% was predicted.

Savings of around 15% were made at the Medical School as a result of energy-saving measures, on top of 9% reductions last year – both of these reductions achieved despite the colder weather. This targeting of resources has helped to reduce the Medical School's portion of our overall energy usage from 19% in 2006/7 to 16% now (see pie chart in section 1.F)

Savings of 1% were achieved at King's Meadow Campus, despite increased utilisation of space and resources at that site. Note that there were no new buildings using fossil fuels commissioned during the year.

Fossil Fuel Consumption	MWh	MWh	MWh	Change	Floor Area (m ²)
	2006/7	2007/8	2008/9	'07/8 to '08/9	
University Park	58,448	65,671	67,324	3%	310,823
Sutton Bonington	15,463	17,531	15,473	-12%	55,086
Jubilee Campus	4,506	5,463	5,632	3%	54,109
Others	5,880	6,664	7,159	7%	40,451
Medical School (Steam)	25,410	26,282	23,100	-12%	50,188
Total	109,708	121,611	118,688	-2%	

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

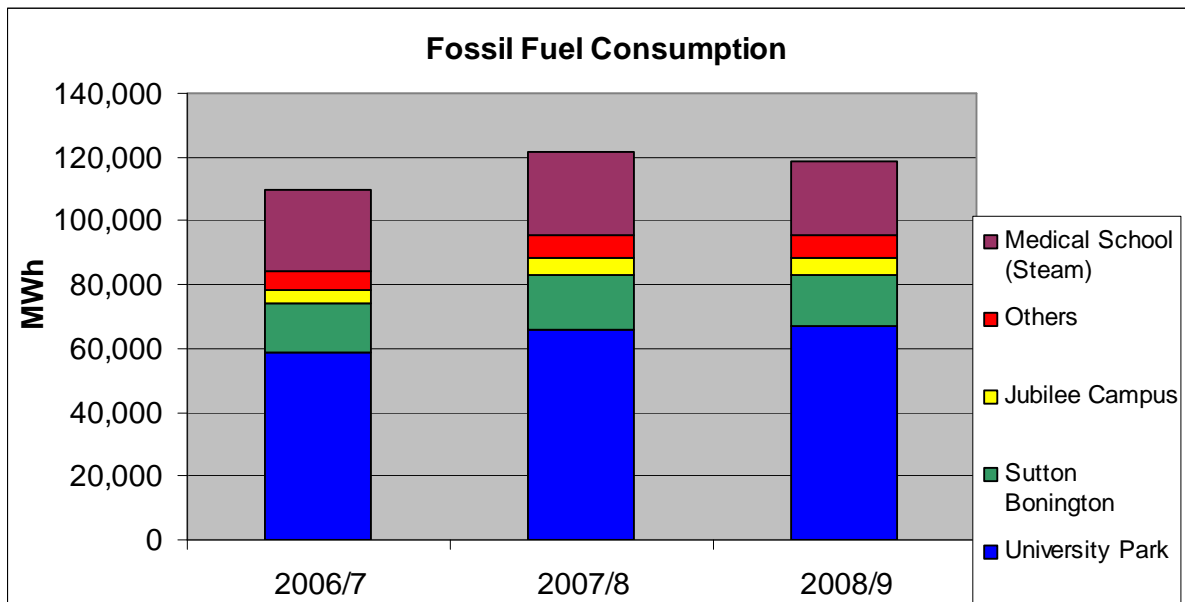


Figure 2.C.2 Graph of fossil fuel usage for the last 3 years split by campus.

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

2.D - Fossil Fuel Costs

The University continued with the flexible purchasing policy first adopted in October 2005, meaning that gas for the main sites was bought in monthly tranches at opportune times, rather than annually.

Gas prices rose steadily throughout the first half of 2008, reaching a peak at the end of August 2008, just as most consumers were fixing prices for the October 2009 contract round. For instance the price for gas to be delivered in January 2009 reached 4.3p/kWh at this point. Prices then fell slowly until Christmas and then plummeted, finally levelling off in the Spring. In the event, our most expensive monthly price was for October 2008 (2.89p/kWh), and March 2009 was bought at 1.69p/kWh when it had been priced at 3.93p/kWh at the end of August 2008. The overall average price paid on the contract worked out at 2.13p/kWh, up just 7% from last year's 1.99p/kWh. Many gas customers on conventional annual contracts would have faced rises of 75% or more across the same period.

Fossil Fuel Costs				Change
	2006/7	2007/8	2008/9	'07/8 to '08/9
University Park	£ 921,632	£ 1,294,418	£ 1,413,980	9%
Sutton Bonington	£ 242,356	£ 346,546	£ 323,372	-7%
Jubilee Campus	£ 76,186	£ 110,910	£ 122,771	11%
Others	£ 107,072	£ 143,077	£ 174,378	22%
Medical School (Steam)	£ 417,046	£ 767,047	£ 702,000	-8%
Total	£ 1,764,292	£ 2,661,998	£ 2,736,501	3%

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

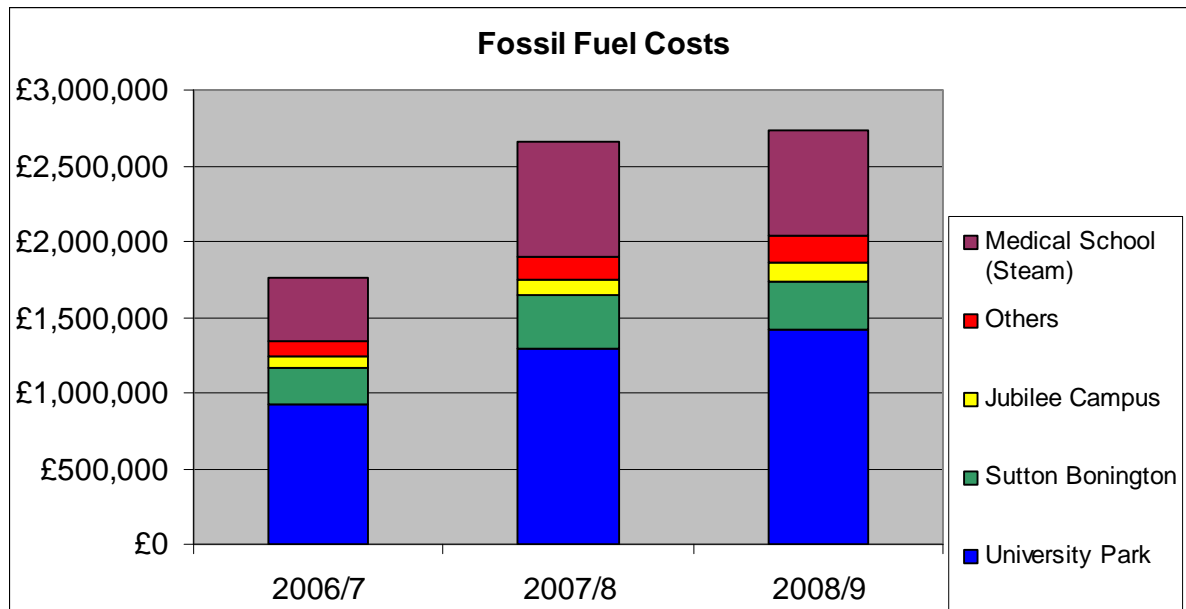


Figure 2.D.2 Graph of fossil fuel costs for the last 3 years split by campus.

Note: 'Firm' gas is the standard gas supply used by the majority of smaller buildings in the UK. However many larger installations use an 'interruptible' supply. Whilst this is slightly cheaper, Transco reserve the right to stop the supply for several days a year, forcing users to switch to an alternative fuel source, such as oil.

2.E - Water Consumption

Water consumption decreased by an impressive 9% in 2008/9. Total water consumption was as high as 925,590 cubic metres back in 2004/5, 36% above the current level.

Most campuses saw modest rises in 2008/9, but these were more than offset by the reductions achieved at University Park. Although usage in buildings is now reasonably well-controlled with the introduction of devices such as Cistermiser urinal controls, overall consumption is heavily influenced by leakage on our networks. It is thought that identification and repair of a number of leaks has been responsible for this year's reductions.

Water Consumption	cubic m.	cubic m.	cubic m.	Change	Floor Area (m2)
	2006/7	2007/8	2008/9	'07/8 to '08/9	
University Park	473,754	475,458	389,588	-18%	310,823
Sutton Bonington	102,870	134,277	141,907	6%	55,086
Jubilee Campus	75,818	84,037	93,768	12%	54,109
Others	20,940	11,841	12,333	4%	40,451
Medical School	43,628	41,862	40,800	-3%	50,188
Total	717,010	747,475	678,396	-9%	

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

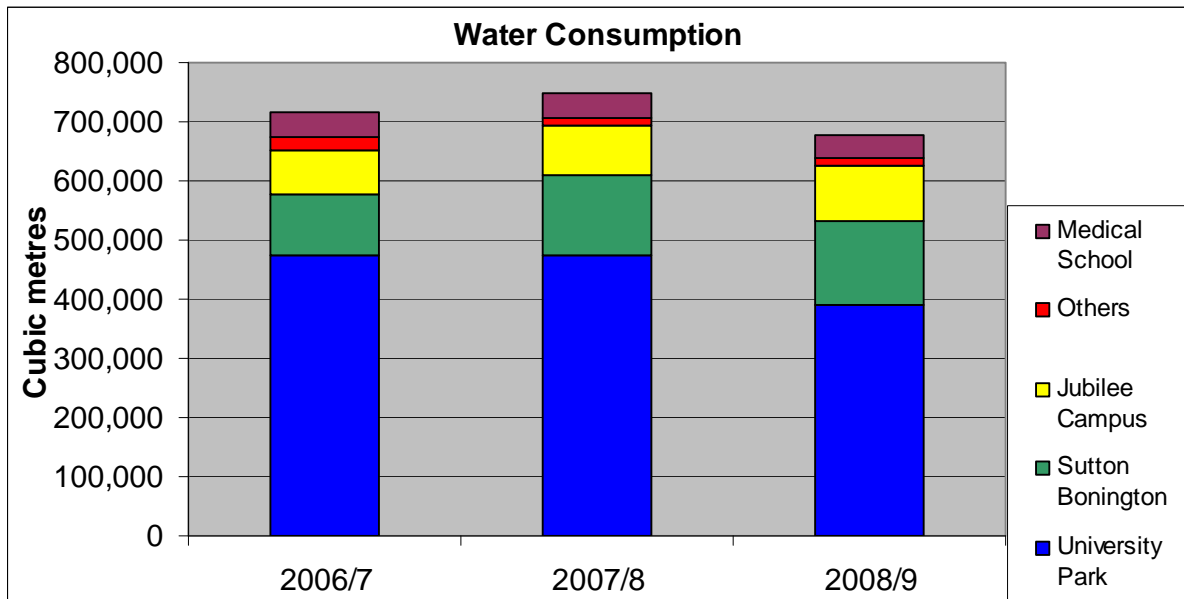


Figure 2.E.2 Graph of water usage for the last 3 years split by campus.

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

2.F - Water Costs

Severn Trent increased their prices for water supply and sewerage by around 6% in April 2009, on top of previous annual rises of 3.5%, 7.5% and 16%.

The price of water supplied increased by 6.6% in April 2009 to 86.84p/m³ in summer and 46.53p/m³ in winter for large sites such as University Park. Sewerage rates at large sites were up 3.9%, to 81.89p/m³. Surface water drainage, which is based on site area, went up another 6.1% in April 2009.

Water costs improved by more than could be expected due to improved leak detection on University Park and as the accounts at Jubilee Campus were reorganised to take advantage of Severn Trent Water's Large User Tariff. Savings were also made on surface water drainage at Jubilee Campus by aggregating all of the supplies onto one account.

Water Costs				Change
	2006/7	2007/8	2008/9	'07/8 to '08/9
University Park	£ 644,000	£ 744,567	£ 578,993	-22%
Sutton Bonington	£ 153,728	£ 204,167	£ 203,490	0%
Jubilee Campus	£ 156,543	£ 178,946	£ 169,998	-5%
Others	£ 52,797	£ 45,326	£ 48,901	8%
Medical School	£ 65,512	£ 80,000	£ 78,000	-3%
Total	£ 1,072,580	£ 1,253,006	£ 1,079,381	-14%

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

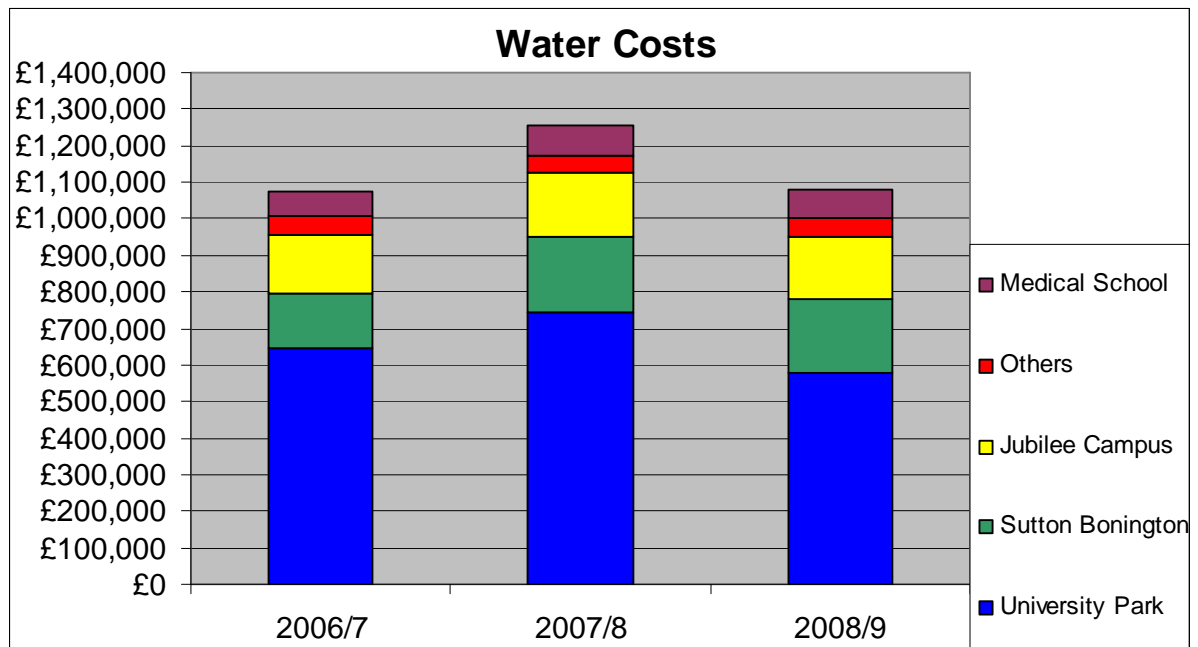


Figure 2.F.2 Graph of water costs for the last 3 years split by campus.

Section 3 – Environmental Considerations

3.A - Carbon Dioxide Emissions

Overall emissions of carbon dioxide from all energy sources fell for the third year running, down 3% overall. This was down to reductions in energy consumption.

We continued to purchase 'green', LEC-accredited energy from GazdeFranceSuez. This was available at a cost premium of 5% over CCL, totalling around £17,600. However, there were also additional on-costs of approximately £150,000 as CCL costs on non-green energy would have been reclaimable in research areas. This total cost of approximately £167,600 saved some 35,520 Tonnes of CO₂, emissions which would be attributed to non-green electricity supplies.

CO2 Emissions	Tonnes	Tonnes	Tonnes	Change	Floor Area (m2)
	2006/7	2007/8	2008/9	'07/8 to '08/9	
University Park	14,732	12,149	12,455	3%	310,823
Sutton Bonington	3,804	3,243	2,862	-12%	55,086
Jubilee Campus	1,702	1,414	1,446	2%	54,109
Others	2,209	1,824	1,915	5%	40,451
Medical School	9,138	9,210	8,385	-9%	50,188
Total	31,584	27,841	27,063	-3%	

Figure 3.A.1 Table of CO₂ emissions for the last 3 years split by campus.

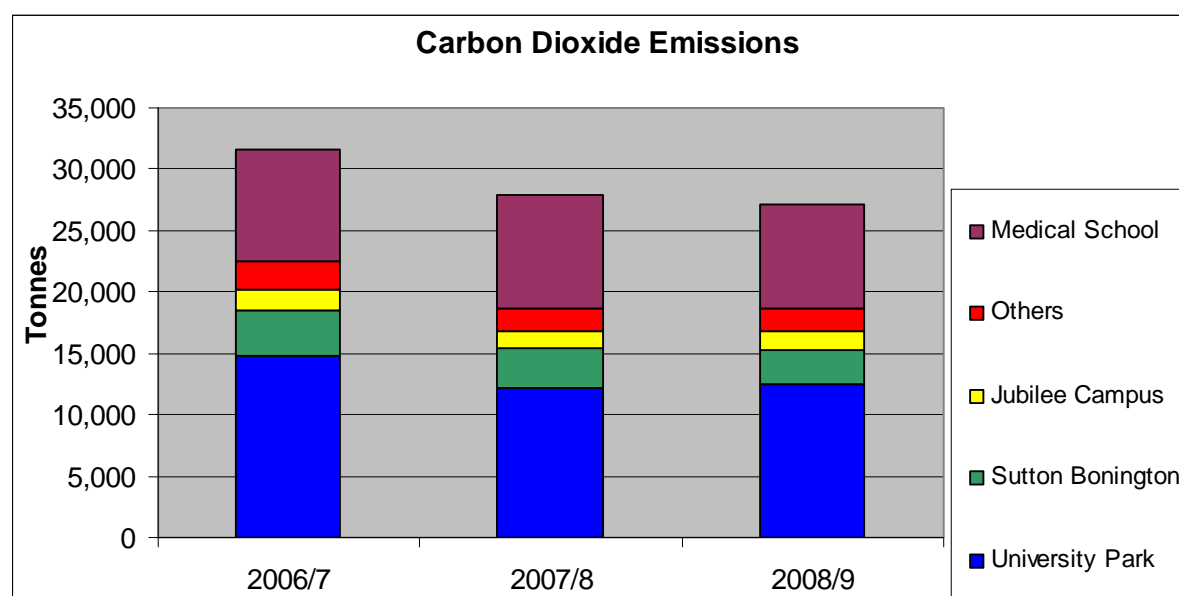


Figure 3.A.2 Graph of CO₂ emissions for the last 3 years split by campus.

Conversion factors used are supplied to us by the Carbon Trust - units are Tonnes of Carbon Dioxide emitted per MWh of energy consumed.

3.B - Carbon Dioxide Emissions Breakdown by Campus and Utilities

CO2 Emissions 2008/2009	Tonnes Electricity	Tonnes Fossil Fuels	Tonnes Total
University Park	-	12,455	12,455
Sutton Bonington	-	2,862	2,862
Jubilee Campus	404	1,042	1,446
Others	591	1,324	1,915
Medical School	4,112	4,274	8,385
Total	5,106	21,957	27,063

Figure 3.B.1 Table of CO₂ emissions split by campus and by utility

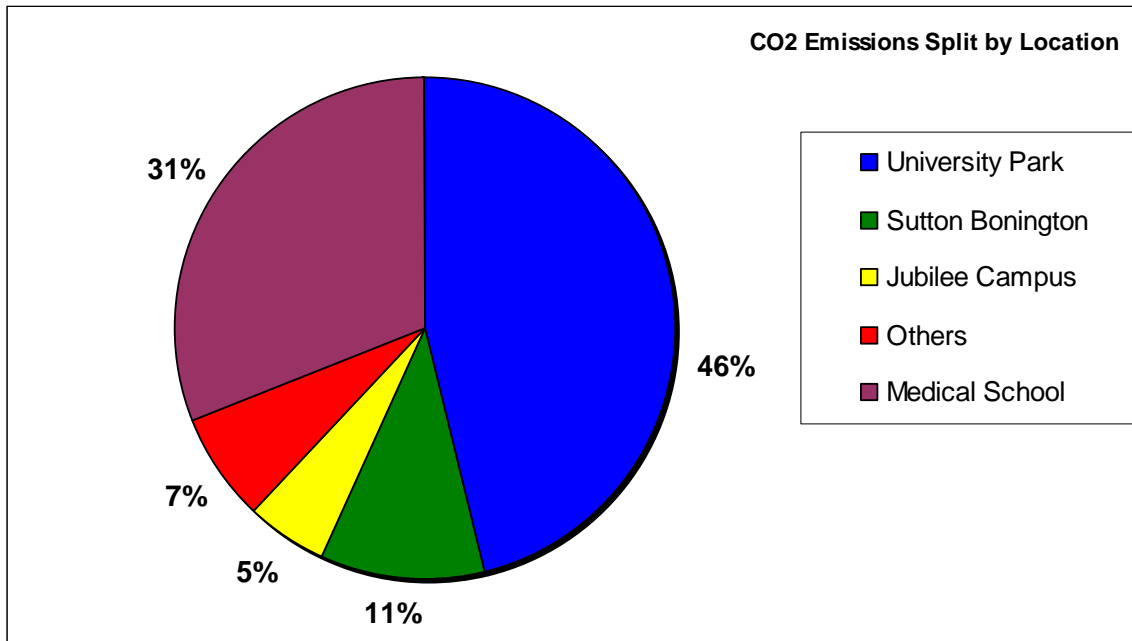


Figure 3.B.2 Chart of CO₂ emissions split by campus

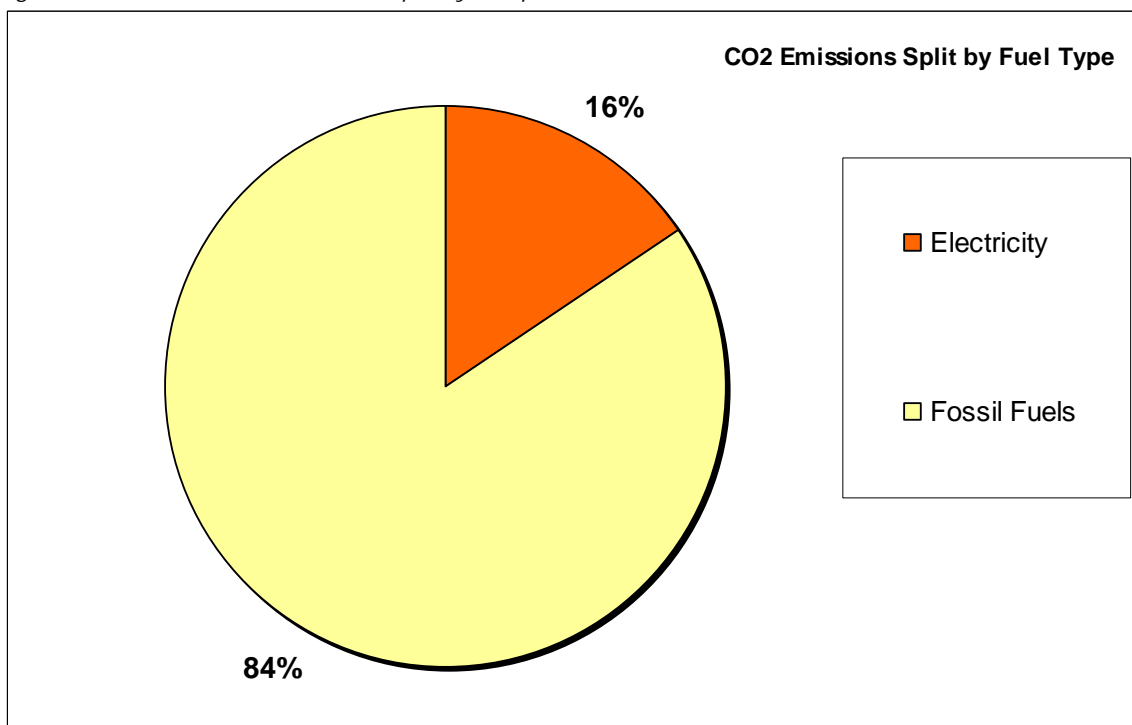


Figure 3.B.3 Chart of CO₂ emissions split by source fuel type

3.C - Weather Data – Degree Days

This year's degree day information indicates consumption of fossil fuels should have increased by about 5%, as 2008/9 was significantly cooler than 2007/8. 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.

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.

	Deg. Days 20 Yr Avg	Deg. Days 2006-07	Deg. Days 2007-08	Deg. Days 2008-09	'07/8 to '08/9 Change
Aug	34	27	35	20	-42.9%
Sep	74	24	66	68	3.0%
Oct	159	88	136	186	36.8%
Nov	266	227	246	264	7.3%
Dec	339	295	331	370	11.8%
Jan	353	269	275	383	39.3%
Feb	304	272	300	327	9.0%
Mar	279	264	299	272	-9.0%
Apr	212	133	233	165	-29.2%
May	134	127	102	114	11.8%
Jun	70	49	65	65	0.0%
Jul	34	32	36	29	-19.4%
Total	2,258	1,807	2,124	2,263	6.5%
				Weather modifier (75%)	4.9%

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

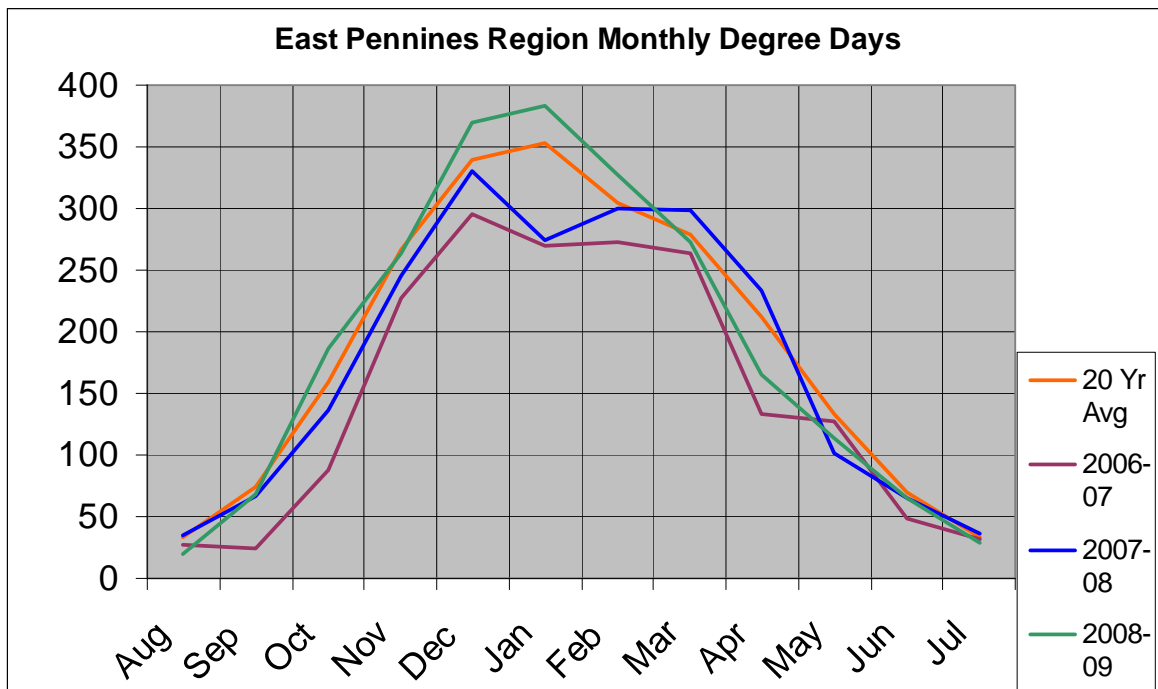


Figure 3.C.2 Graph showing last three years monthly degree days and average degree days

Section 4 – Appendices

4.A - Appendix A – Electricity Data

Electricity Invoices		2008/9	2007/8	% change	2008/9	2007/8	% change
Main Campus		kWh	kWh	kWh	£	£	£
University Park	1000	46,813,504	45,983,960	2%	£3,801,592	£3,500,649	9%
Lenton Lodge	2251	24,812	18,700	33%	£2,536	£2,000	27%
Lenton Eaves Cottage no.2	1464	21,287	35,683	-40%	£2,330	£3,061	-24%
Redcourt Lodge		1,623	900	80%	£448	£200	124%
Lenton Eaves Cottage no.1	1464	1143	7,100	-84%	£419	£726	-42%
Total of 5 accounts	Totals	46,862,369	46,046,343	2%	£3,807,325	£3,506,636	9%
Electricity Invoices		2008/9	2007/8	% change	2008/9	2007/8	% change
Sutton Bonington		kWh	kWh	kWh	£	£	£
Sutton Bonington Campus	6800	10,733,730	10,627,338	1%	£875,274	£811,274	8%
New Dairy		300,000	300,000	0%	£45,000	£40,000	13%
44 College Road	6814	33,157	7,587	337%	£3,610	£683	429%
St.Michael's House (Flats 1-5)	6841	30,215	17,000	78%	£3,229	£2,000	61%
Melton Lane Building A	5433	23,873	18,000	33%	£2,562	£2,000	28%
Bunny Park Farm	6860	23,249	2,000	1062%	£2,331	£200	1066%
Manor Farm NU Press 2	6910	15,988	8,300	93%	£1,848	£1,400	32%
Eviton House (68 College Road)	5891	13,938	35,923	-61%	£1,481	£2,658	-44%
St.Michael's Flats Nos 8&9	6843	9,273	17,000	-45%	£1,343	£1,000	34%
Dairy Herdsman's Farmhouse		8,859	3,072	188%	£1,140	£462	147%
St.Michael's Flats Nos 6&7	6842	8,523	11,000	-23%	£1,408	£1,300	8%
Manor Farm NU Press 1	6910	7,135	6,000	19%	£1,006	£800	26%
24 College Road	6805	5,749	6,747	-15%	£796	£665	20%
40 College Road	6811	4,729	2,828	67%	£709	£339	109%
St.Michael's Close (Flats 10-15)	6840	4,358	4,000	9%	£692	£500	38%
50 College Road	6819	4,005	4,059	-1%	£677	£442	53%
45 College Road	6815	2,435	2,323	5%	£716	£195	267%
Manor F. Pump Kingston Brook	6910	29	0	n/a	£415	£146	184%
Manor Farm Soar Irrig. Pump	6910	26	0	n/a	£327	£156	110%
Total of 19 accounts	Totals	11,229,271	11,073,177	1%	£944,564	£866,220	9%
Electricity Invoices		2008/9	2007/8	% change	2008/9	2007/8	% change
Jubilee Campus		kWh	kWh	kWh	£	£	£
Jubilee Campus Main supply	7000	5,494,400	4,357,201	26%	£435,657	£339,594	28%
Newark & Southwell Halls	7000	751,896	752,472	0%	£62,849	£56,696	11%
Jubilee Sports Centre	7301	201,146	169,128	19%	£20,922	£17,724	18%
Total of 3 accounts	Totals	6,447,442	5,278,801	22%	£519,428	£414,014	25%
Electricity Invoices		2008/9	2007/8	% change	2008/9	2007/8	% change
Others		kWh	kWh	kWh	£	£	£
King's Meadow Campus	6901	3,256,829	2,973,529	10%	£253,339	£235,718	7%
Derby Medical School	3561	865,447	842,869	3%	£77,573	£70,457	10%
Clinical Sciences (City Hospital)	3325	975,000	1,000,000	-3%	£110,000	£110,000	0%
14-22 Shakespeare Street	6101	64,438	87,000	-26%	£6,624	£10,000	-34%
Boat House	6321	30,659	20,000	53%	£2,675	£1,900	41%
Grove Farm - Changing Rooms	6122	24,914	10,672	133%	£2,421	£827	193%
Sports Ground - Highfields	6311	18,227	30,000	-39%	£5,989	£3,700	62%
Clumber Lodge	6900	14,475	23,470	-38%	£1,598	£1,943	-18%
8 Peachey Street	6102	12,916	16,000	-19%	£1,348	£2,000	-33%
Grove Farm - Old Farmhouse	6121	12,063	17,000	-29%	£1,295	£2,100	-38%
Unit 5, William Lee Buildings	6885	4,584	27,000	-83%	£467	£3,300	-86%
Unit 6, William Lee Buildings	6883	4,209	28,000	-85%	£438	£3,500	-87%
Grove Farm	6123	3,908	16,000	-76%	£649	£2,000	-68%
Unit 8, William Lee Buildings	6884	3,297	25,000	-87%	£355	£3,000	-88%
Unit 8, Edison Village (Synergy Hou	6891	0	31,592	-100%	£21	£2,619	-99%
Total of 15 accounts	Totals	5,290,966	5,148,132	3%	£464,792	£453,064	3%
Electricity Invoices		2008/9	2007/8	% change	2008/9	2007/8	% change
Medical School		kWh	kWh	kWh	£	£	£
Medical School		7,386,240	7,933,327	-7%	£514,705	£454,311	13%
Embedded units (Q.M.C.)		2,184,300	2,187,665	0%	£144,880	£113,184	28%
Totals		9,570,540	10,120,992	-5%	£659,585	£567,495	16%

4.B - Appendix B – Fossil Fuel Data

Gas Invoices		2008/9	2007/8	% change	2008/9	2007/8	% change
Main Campus		kWh	kWh	kWh	£	£	£
Central Heating Station	1000	29,517,304	29,277,699	1%	£566,156	£550,390	3%
Rutland Hall & Sherwood Hall	2191	3,194,587	2,925,496	9%	£87,700	£77,325	13%
Hugh Stewart Hall	2181	2,783,218	2,567,048	8%	£59,224	£50,907	16%
Cripps Hall	2171	2,345,219	2,448,481	-4%	£50,627	£48,299	5%
Derby Hall	2121	1,939,086	1,858,442	4%	£41,713	£36,503	14%
Bio-Molecular Sciences Phase 1	1353	1,782,754	1,685,619	6%	£37,066	£33,211	12%
Bio-Molecular Sciences Phase 2	1353	1,729,250	1,822,161	-5%	£42,716	£40,884	4%
Swimming Pool	1571	1,723,817	1,631,493	6%	£35,838	£31,762	13%
Lenton & Wortley Hall	2141	1,695,116	1,675,591	1%	£36,595	£32,927	11%
Nightingale Hall	2161	1,687,019	1,649,550	2%	£37,169	£32,551	14%
Willoughby Hall	2211	1,515,754	1,540,767	-2%	£32,582	£29,962	9%
Lincoln Hall	2151	1,486,749	1,423,083	4%	£32,185	£28,052	15%
Florence Boot Hall	2131	1,318,304	1,134,588	16%	£28,170	£22,405	26%
Tower, MRI etc	1271	1,270,262	947,690	34%	£27,816	£18,501	50%
Boots Science Building	1581	1,110,177	1,123,223	-1%	£23,681	£21,829	8%
Cavendish Hall	2111	1,050,459	949,001	11%	£23,923	£18,669	28%
Jesse Boot Conference Centre	1481	1,011,781	918,797	10%	£21,758	£18,647	17%
Ancaster Hall	2101	1,007,144	970,947	4%	£21,476	£19,077	13%
Institute of Hearing Research	1401	865,487	866,781	0%	£18,016	£16,652	8%
MMMEM (Production Engineering)	1371	612,208	338,337	81%	£13,331	£6,919	93%
Trent, Law & Social Sciences etc	1101	592,902	675,055	-12%	£13,248	£13,484	-2%
Arts Centre & School of Music	1501	535,541	542,891	-1%	£11,477	£10,596	8%
Staff Club Lenton Mount	1181	532,716	513,402	4%	£11,357	£10,085	13%
Sports Centre, Main Campus	1221	495,376	666,558	-26%	£11,356	£13,414	-15%
Wolfson Building	1421	459,410	463,012	-1%	£10,272	£9,097	13%
Lenton Hurst	2411	444,007	408,679	9%	£9,120	£8,098	13%
Lenton Firs - Built Environment	1431	443,669	428,418	4%	£10,351	£8,453	22%
D.H.Lawrence Lakeside Pavilion	1631	376,965	356,210	6%	£8,237	£7,023	17%
Redcourt	2221	277,331	286,257	-3%	£5,905	£5,495	7%
Cripps Health Centre	1231	249,442	258,603	-4%	£5,471	£5,021	9%
Cripps Hall Kitchen	2171	240,214	306,878	-22%	£5,079	£5,980	-15%
Portland Building	1111	239,731	232,367	3%	£5,309	£4,634	15%
Innovative Technology Research C	1641	203,653	240,586	-15%	£5,044	£6,723	-25%
Sherwood Hall Kitchen	2200	187,596	176,860	6%	£3,947	£3,521	12%
Paton House (Built Env.)	1441	182,793	133,336	37%	£3,956	£2,490	59%
Environmental Education Centre (N	1439	147,406	209,098	-30%	£3,627	£4,329	-16%
Lenton Grove (History)	1211	139,502	177,522	-21%	£3,183	£3,510	-9%
Lenton Eaves (UNSSC)	1461	132,660	111,632	19%	£3,058	£2,708	13%
Lenton & Wortley Hall Kitchen	2141	118,643	117,098	1%	£2,525	£2,289	10%
Lincoln Hall Kitchen	2151	115,586	108,635	6%	£2,505	£2,149	17%
Sports Centre, Main Campus	1221	108,481	86,514	25%	£2,536	£1,621	56%
Rutland Hall Extension	2195	108,161	103,993	4%	£2,343	£1,996	17%
Rutland Hall Kitchen	2191	104,524	64,937	61%	£2,140	£1,279	67%
Cavendish Hall Extension	2115	103,382	108,655	-5%	£8,903	£2,090	326%
Sustainable Research Building	1436	103,332	90,473	14%	£2,480	£1,882	32%
Cavendish Hall Kitchen	2111	101,756	103,139	-1%	£2,116	£2,054	3%
Portland Building	1111	101,453	101,604	0%	£2,123	£2,083	2%
Lenton Close Annexe (Cripps Hall)	2175	98,505	145,142	-32%	£2,106	£2,840	-26%
Orchards	1161	87,112	91,050	-4%	£1,925	£1,803	7%
Playgroup	1411	85,420	89,081	-4%	£1,883	£1,752	7%
Lenton Fields (China House)	2163	71,421	80,000	-11%	£1,567	£800	96%
Warden's House Sherwood Hall	2207	68,110	62,923	8%	£1,468	£1,223	20%
Former Warden's House, Cavendis	2113	65,495	62,100	5%	£1,383	£1,181	17%
J.Boot C.C. Annexe (Cottage)	1482	50,844	52,307	-3%	£1,073	£1,028	4%
Lenton Lodge	2251	47,649	49,801	-4%	£1,063	£2,219	-52%
Warden's House Rutland Hall	2194	43,238	40,134	8%	£967	£794	22%
Warden's House Ancaster Hall	2105	41,533	35,237	18%	£1,244	£699	78%
Paton Cottage	####	34,967	34,294	2%	£746	£669	12%
1 Nightingale Close (Nigh.Hall War	2321	34,907	37,404	-7%	£729	£758	-4%
Lenton Firs Lodge West	2241	26,038	3,370	673%	£532	£73	629%
5A Wortley Hall Close (Eco-House)	2296	25,572	23,583	8%	£542	£477	14%
Warden's House Florence Boot Hal	2133	24,957	22,499	11%	£542	£432	25%
New Eco-houses		14,630	162	8931%	£436	-£189	-331%
Sherwood Hall Laundry	2200	6184	6,807	-9%	£133	£134	-1%
Energy Learning Unit (old Squash C	1223	5,746	8,113	-29%	£231	£149	55%
Total of 65 accounts	Totals	67,324,255	65,671,213	3%	£1,413,980	£1,294,418	9%

4.B - Appendix B – Fossil Fuel Data continued

Gas Invoices		2008/9	2007/8	% change	2008/9	2007/8	% change	
Sutton Bonington		kWh	kWh	kWh	£	£	£	
Main Boilerhouse	6800	8,180,661	10,155,872	-19%	£166,838	£198,921	-16%	Est'd bills
Plant Sciences	5711	2,371,742	2,270,520	4%	£51,774	£44,191	17%	
Animal Houses Boilerhouse	6800	2,289,125	2,328,479	-2%	£47,750	£44,715	7%	
Veterinary School	5721	1,614,331	1,595,114	1%	£35,261	£36,223	-3%	
Sports Hall SB (New)	5951	293,225	179,465	63%	£6,312	£2,894	118%	First full year
The Elms (Environmental Science)	5161	167,303	129,853	29%	£3,538	£2,514	41%	
Main Building (Sutton Bonington)	5011	91,381	106,748	-14%	£2,018	£2,101	-4%	
St.Michael's Flats Nos 6&7	6842	70,321	44,737	57%	£1,697	£1,060	60%	Estimated bills
Food Hall	5081	69,569	70,733	-2%	£1,420	£1,389	2%	
Food Sciences Building	5701	62,265	61,406	1%	£1,265	£1,170	8%	
Portakabins (T.C.R. unit)	5301	55,107	197,145	-72%	£1,207	£4,077	-70%	
Bonington Hall Laundry & Gym	5881	40,141	31,695	27%	£881	£626	41%	
St.Michael's House Flat 5	6841	28,485	31,084	-8%	£607	£553	10%	
Bonington Hall Warden's House	5842	25,276	26,860	-6%	£497	£532	-7%	
St.Michael's House Flat 2	6841	23,950	27,817	-14%	£517	£493	5%	
52 College Road	6820	20,484	19,767	4%	£392	£397	-1%	
St.Michael's House Flat 3	6841	18,579	20,370	-9%	£400	£344	16%	
24 College Road	6805	18,463	19,274	-4%	£419	£385	9%	
St.Michael's House Flat 1	6841	15,386	41,590	-63%	£282	£726	-61%	
St.Michael's Flats Nos 8&9	6843	11,393	45,227	-75%	£174	£835	-79%	
St.Michael's House Flat 4	6841	3,690	3,132	18%	£78	£131	-40%	
North Laboratory	5091	2,063	757	173%	£52	£15	247%	
South Laboratory	5051	63	0	-	£1	£0	-	
Sports Pavilion Sutton Bonington - F	5621	0	69,754	-100%	£0	£1,247	-100%	
Hathern House, Bon. Hall (4)	5831	0	26,823	-100%	£0	£499	-100%	
Eviton House (68 College Road)	5891	0	0	-	£0	£0	-	
The Firs (Surgery No.2)	5233	0	0	-	£0	£0	-	
Sports Hall Sutton Bonington (Vet L	5221	-320	27,151	-101%	£-8	£508	-102%	
Total of 26 accounts	Totals	15,472,683	17,531,373	-12%	£323,372	£346,546	-7%	
Gas Invoices		2008/9	2007/8	% change	2008/9	2007/8	% change	
Jubilee Campus		kWh	kWh	kWh	£	£	£	
Newark Hall	7130	1,249,019	1,238,077	1%	£27,324	£24,680	11%	
Southwell Hall	7120	687,605	670,970	2%	£14,965	£13,452	11%	
The Exchange (CTF)	7030	670,419	535,971	25%	£14,282	£10,770	33%	
Melton Hall	7110	645,073	743,170	-13%	£13,946	£14,517	-4%	
Computer Sciences (DCS) & The A	7040	599,800	645,756	-7%	£13,043	£12,742	2%	
New Business School (South)	7080	504,004	527,618	-4%	£11,228	£10,588	6%	
Dearing Building (FOE)	7050	468,965	408,992	15%	£10,153	£8,129	25%	
Business School North (SMF)	7020	356,829	336,190	6%	£7,911	£6,881	15%	
Jubilee Sports Centre	7301	306,045	216,604	41%	£6,970	£6,417	9%	
Computer Sciences (DCS) & The A	7040	144,271	139,713	3%	£2,949	£2,734	8%	
Total of 10 items		5,632,030	5,463,061	3%	£122,771	£110,910	11%	
Gas Invoices		2008/9	2007/8	% change	2008/9	2007/8	% change	
Others		kWh	kWh	kWh	£	£	£	
King's Meadow Campus	6901	3,300,253	3,343,079	-1%	£72,333	£66,053	10%	
Clinical Sciences (City Hospital)	3325	1,700,000	1,500,000	13%	£50,000	£38,000	32%	
Derby Medical School	3561	1,045,595	903,775	16%	£22,253	£17,967	24%	
Grove Farm - OIL	6122	302,966	89,130	240%	£11,407	£4,164	174%	
14-22 Shakespeare Street	6101	233,434	260,597	-10%	£5,218	£5,245	-1%	
Sports Ground - Highfields	6311	191,071	140,126	36%	£4,062	£2,714	50%	
Clumber Lodge	6900	139,747	171,158	-18%	£3,325	£3,170	5%	
8 Peachey Street	6102	116,932	85,474	37%	£2,528	£1,752	44%	
Boathouse - OIL	6321	49,723	13,957	256%	£1,426	£570	150%	
Sports Ground - Highfields	6311	47,299	24,773	91%	£892	£438	104%	
Unit 8, William Lee Buildings	6884	19,070	48,085	-60%	£604	£1,427	-58%	
Unit 5, William Lee Buildings	6885	7,914	50,502	-84%	£203	93900%	-78%	
Unit 6, William Lee Buildings	6883	4,938	33,231	-85%	£127	£638	-80%	
Total of 13 accounts		7,158,942	6,663,887	7%	£174,378	£143,077	22%	
Steam Used		2008/9	2007/8	% change	2008/9	2007/8	% change	
Medical School		kWh	kWh	kWh	£	£	£	
Medical School		18,300,000	21,612,968	-15%	£552,000	£631,498	-13%	Est'd from Uni meters
Embedded Units (Q.M.C.)		4,800,000	4,668,665	3%	£150,000	£135,549	11%	Est'd
		23,100,000	26,281,633	-12%	£702,000	£767,047	-8%	

4.C - Appendix C – Water Data

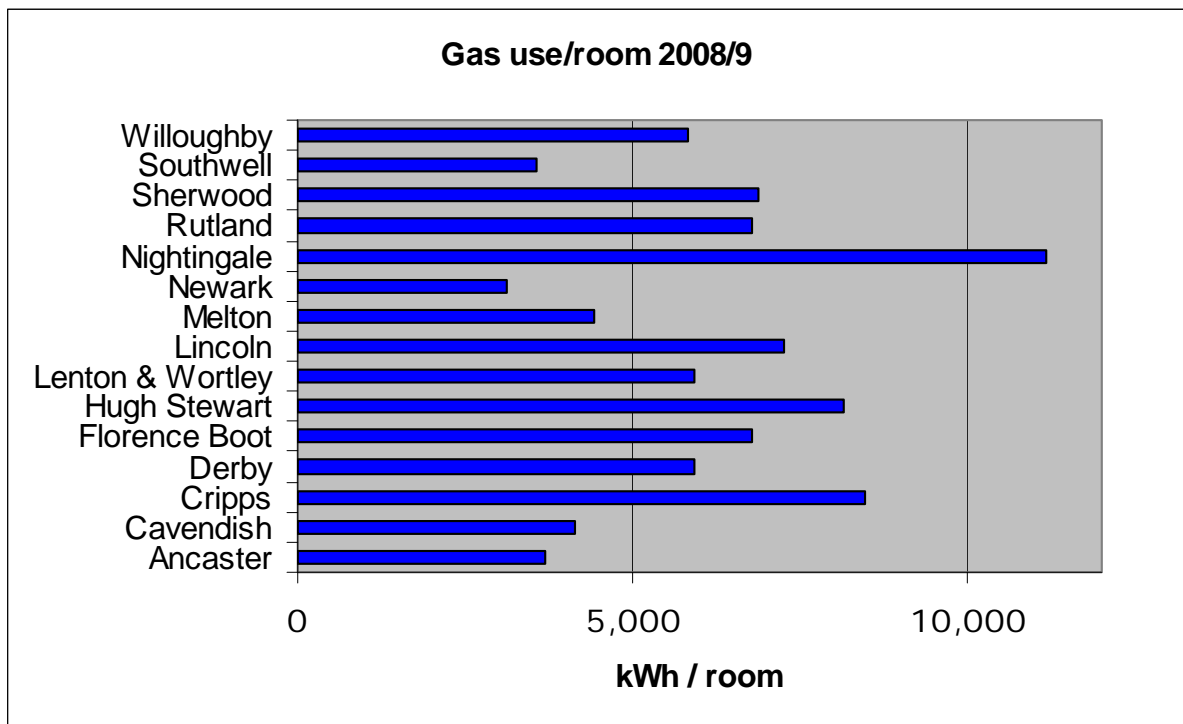
Water Invoices		2008/9	2007/8	% change	2008/9	2007/8	% change
Main Campus		cubic m.	cubic m.	cubic m.	£	£	£
Main Supply, Sth. entrance	1000	362,477	444,714	-18%	£0	£0	n/a
Nightingale Hall	2161	9,360	10,890	-14%	£0	£0	n/a
Science Area	1000	7,820	8,979	-13%	£0	£0	n/a
Jesse Boot Conference Centre	1481	2,711	2,948	-8%	£0	£0	n/a
Jesse Boot Conference Centre	1481	2,123	2,489	-15%	£0	£0	n/a
Lenton Hurst	2411	1,247	1,102	13%	£0	£0	n/a
Lenton Eaves (UNSSC)	1461	760	755	1%	£0	£0	n/a
Paton House (Built Env.)	1441	718	346	107%	£0	£0	n/a
Redcourt	2221	463	1,073	-57%	£0	£0	n/a
Beeston Lane Gardeners' Compou	1511	429	318	35%	£0	£0	n/a
Lenton Lodge	2251	418	754	-45%	£0	£0	n/a
Lenton Firs - Built Environment	1431	400	512	-22%	£0	£0	n/a
Lenton Grove (History)	1211	369	230	60%	£0	£0	n/a
Playgroup	1411	240	294	-18%	£0	£0	n/a
5A Wortley Hall Close (Eco-House)	2296	54	54	2%	£0	£0	n/a
TE & Sewerage	1000	0	0	n/a	£292,280	£299,428	-2% Est from Apr09
Water + SWD Invoices	1000	0	0	n/a	£286,713	£445,139	-36%
Total of 17 accounts	Total:	389,588	475,458	-18%	£578,993	£744,567	-22%
Water Invoices		2008/9	2007/8	% change	2008/9	2007/8	% change
Sutton Bonington		cubic m.	cubic m.	cubic m.	£	£	£
Landcroft Lane meter	6800	131,048	124,649	5%	£0	£0	n/a
College Road meter	6800	8,934	8,132	10%	£0	£0	n/a
St.Michael's House (Flats 1-5)	6841	1,838	1,276	44%	£3,867	£2,558	51%
Bunny Park Farm	6860	88	220	-60%	£131	£104	26%
SB Campus TE costs	6800	0	0	n/a	£108,000	£96,730	12% Est from Apr09
SB Campus water costs	6800	0	0	n/a	£91,471	£104,754	-13%
Trough, Kegworth	6910	0	0	n/a	£21	£22	-6%
Total of 7 items		141,907	134,277	6%	£203,490	£204,167	0%
Water Invoices		2008/9	2007/8	% change	2008/9	2007/8	% change
New Campus		cubic m.	cubic m.	cubic m.	£	£	£
Jubilee Campus main meter	7000	65,252	60,773	7%	£0	£0	n/a
Newark Hall	7130	15,730	14,377	9%	£0	£31,200	-100%
Southwell Hall	7120	9,681	7,990	21%	£0	£18,927	-100%
The Amenities Building	7330	957	0	n/a	£0	£0	n/a
International House	7320	938	0	n/a	£0	£0	n/a
Sir Colin Campbell Building	7340	600	0	n/a	£0	£0	n/a Estd.
Jubilee Sports Centre	7301	585	473	24%	£0	£3,818	-100%
Charnock Ave Sports Pavilion	7201	27	24	13%	£107	£77	39%
Jubilee Campus Invoices	7000	0	0	n/a	£169,755	£123,726	37% Group billing
Triumph House	6701	0	400	-100%	£136	£1,198	-89%
Total of 10 items		93,768	84,037	12%	£169,998	£178,946	-5%
Water Invoices		2008/9	2007/8	% change	2008/9	2007/8	% change
Others		cubic m.	cubic m.	cubic m.	£	£	£
King's Meadow Campus	6901	7,625	6,800	12%	£37,376	£35,000	7%
Clinical Sciences (City Hospital)	3325	1,500	1,800	-17%	£4,000	£3,700	8% Estd 08/9
Sports Ground - Highfields	6311	1,134	1,034	10%	£2,392	£2,072	15%
Grove Farm - Changing Rooms	6122	1,001	980	2%	£1,264	£1,150	10%
14-22 Shakespeare Street	6101	550	399	38%	£1,000	£796	26% Estd from May 09
Boat House	6321	339	361	-6%	£2,287	£718	218%
Clumber Lodge	6900	130	246	-47%	£175	£326	-46%
8 Peachey Street	6102	31	38	-20%	£161	£157	2%
Unit 5, William Lee Buildings	6885	14	92	-85%	£96	£545	-82%
Unit 8, Edison Village (Synergy Hou	6891	6	34	-82%	£34	£157	-78%
Unit 6, William Lee Buildings	6883	4	57	-93%	£100	£612	-84%
Unit 8, William Lee Buildings	6884	0	0	n/a	£16	£93	-83%
Total of 12 accounts		12,333	11,841	4%	£48,901	£45,326	8%
Water Recharges		2008/9	2007/8	% change	2008/9	2007/8	% change
Medical School		cubic m.	cubic m.	cubic m.	£	£	£
Medical School		30,000	31,062	-3%	£60,000	£63,000	-5% Last 4 months estd.
Embedded Units (Q.M.C.)		10,800	10,800	0%	£18,000	£17,000	6% Last 4 months estd.
		40,800	41,862	-3%	£78,000	£80,000	-3%

4.D - Appendix D – Halls of Residence

4.D. Gas Consumption in Halls of residence

	No. of Rooms	2007/8 Gas kWh	2008/9 Gas kWh	2007/8 Gas kWh/room	2008/9 Gas kWh/room
Ancaster	272	970,947	1,007,144	3,570	3,703
Cavendish	279	1,057,656	1,153,841	3,791	4,136
Cripps	317	2,900,502	2,683,938	9,150	8,467
Derby	327	1,858,442	1,939,086	5,683	5,930
Florence Boot	194	1,134,588	1,318,304	5,848	6,795
Hugh Stewart	341	2,567,048	2,783,218	7,528	8,162
Lenton & Wortley	307	1,792,689	1,813,759	5,839	5,908
Lincoln	221	1,531,718	1,602,335	6,931	7,250
Melton	146	743,170	645,073	5,090	4,418
Newark	400	1,238,077	1,249,019	3,095	3,123
Nightingale	151	1,649,550	1,687,019	10,924	11,172
Rutland	267	1,631,678	1,809,978	6,111	6,779
Sherwood	261	1,646,416	1,791,073	6,308	6,862
Southwell	193	670,970	687,605	3,477	3,563
Willoughby	260	1,540,767	1,515,754	5,926	5,830
Totals	3936	22,934,217	23,687,146	5,827	6,018

Figure 4.D.1 Table showing last two years annual gas consumption in halls



Graph 4.D.2 Graph showing gas consumption per room in halls

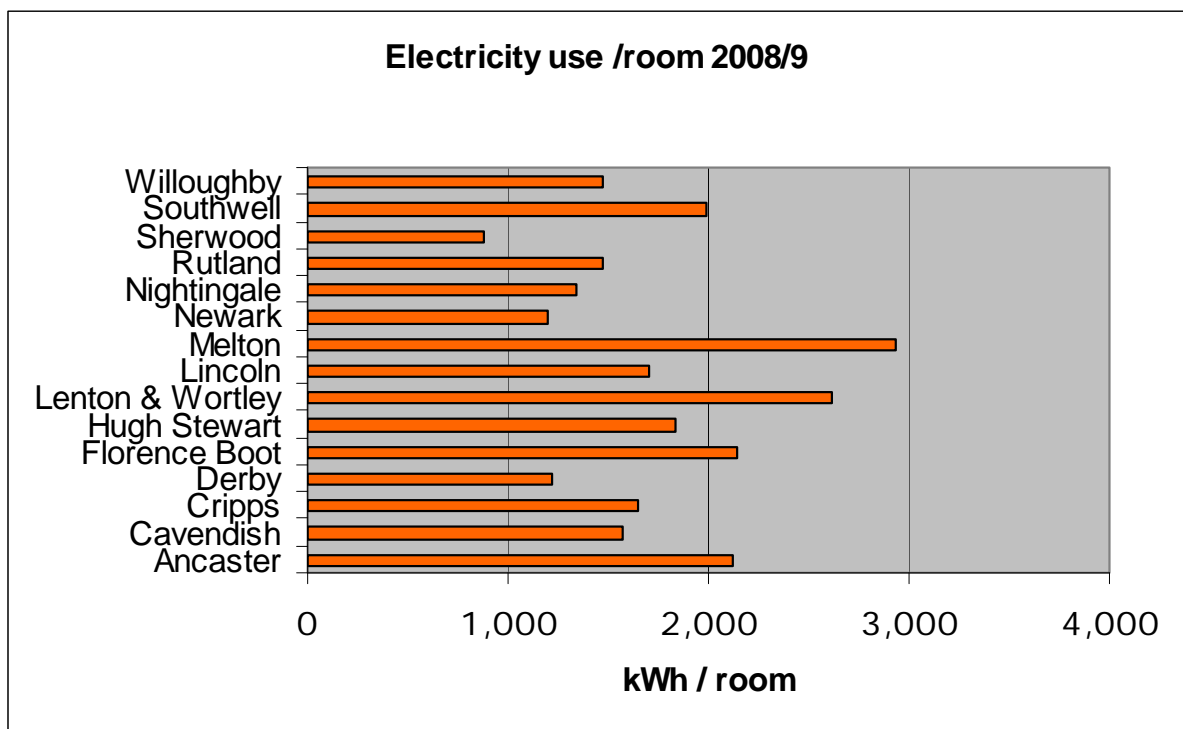
The relatively high usage per room at Nightingale Hall is because the room sizes there are particularly large. Note that the newer halls (Newark, Southwell and Melton) are shown to be relatively efficient; Cavendish and Ancaster look good but do have electrically heated blocks that are not included on this graph.

4.D - Appendix D – Halls of Residence continued

4.D. Electricity Consumption in Halls of residence

	No. of Rooms	2007/8Elec kWh	2008/9Elec kWh	2007/8 Elec kWh/room	2008/9 Elec kWh/room
Ancaster	272	517,680	575,870	1,903	2,117
Cavendish	279	369,430	437,187	1,324	1,567
Cripps	317	545,543	523,635	1,721	1,652
Derby	327	381,157	400,539	1,166	1,225
Florence Boot	194	401,833	415,060	2,071	2,139
Hugh Stewart	341	633,068	625,522	1,857	1,834
Lenton & Wortley	307	573,337	804,406	1,868	2,620
Lincoln	221	252,489	377,000	1,142	1,706
Melton	146	460,731	429,000	3,156	2,938
Newark	400	495,071	480,227	1,238	1,201
Nightingale	151	204,519	201,678	1,354	1,336
Rutland	267	356,891	392,000	1,337	1,468
Sherwood	261	440,575	229,373	1,688	879
Southwell	193	238,578	382,837	1,236	1,984
Willoughby	260	385,310	382,837	1,482	1,472
	3936	6,256,212	6,657,171	1,589	1,691

Figure 4.D.3 Table showing last two years annual electricity consumption in halls



Graph 4.D.4 Graph showing electricity consumption per room in halls

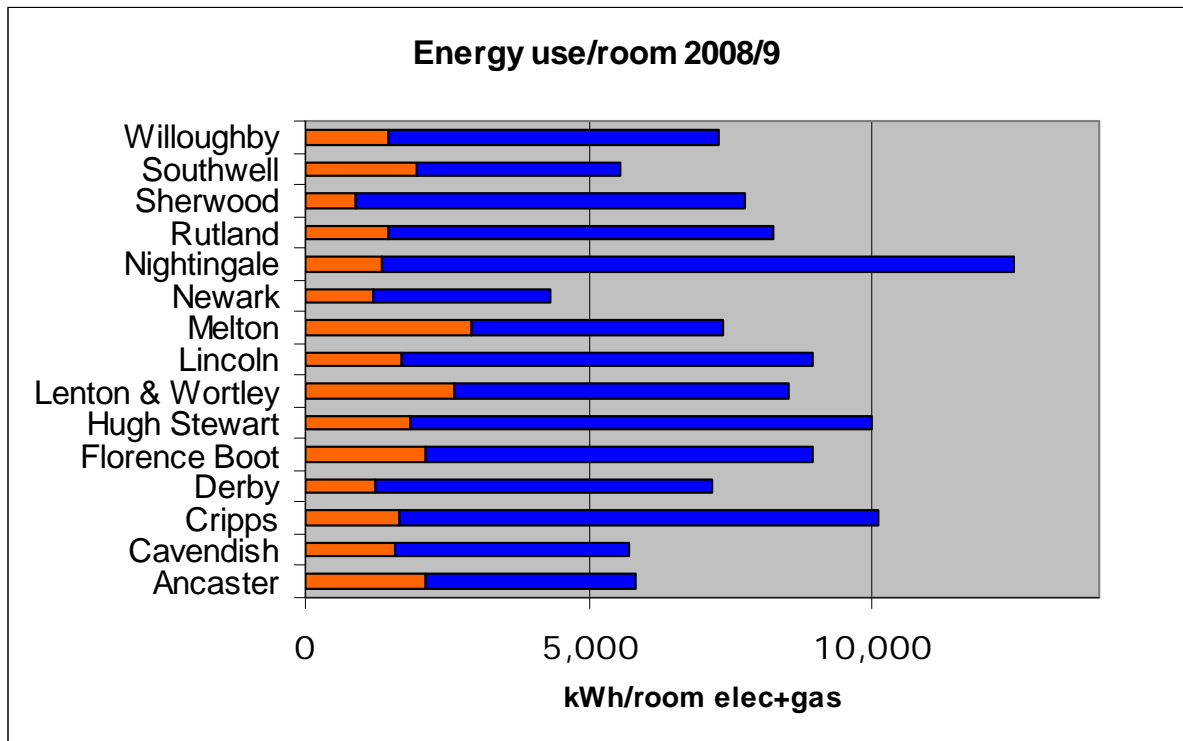
Note that the information in these graphs is being analysed to target resources at buildings where usage appears to be high. Some halls have higher conference usage than others, and Melton Hall has particularly high occupancy rate across the year.

4.D - Appendix D – Halls of Residence continued

4.D. Energy Consumption in Halls of residence

	No. of Rooms	2008/9Elec kWh	2008/9Gas kWh	2008/9 Total kWh/room
Ancaster	272	575,870	1,007,144	5,820
Cavendish	279	437,187	1,153,841	5,703
Cripps	317	523,635	2,683,938	10,119
Derby	327	400,539	1,939,086	7,155
Florence Boot	194	415,060	1,318,304	8,935
Hugh Stewart	341	625,522	2,783,218	9,996
Lenton & Wortley	307	804,406	1,813,759	8,528
Lincoln	221	377,000	1,602,335	8,956
Melton	146	429,000	645,073	7,357
Newark	400	480,227	1,249,019	4,323
Nightingale	151	201,678	1,687,019	12,508
Rutland	267	392,000	1,809,978	8,247
Sherwood	261	229,373	1,791,073	7,741
Southwell	193	382,837	687,605	5,546
Willoughby	260	382,837	1,515,754	7,302
Totals	3936	6,657,171	23,687,146	7,709

Figure 4.D.5 Table showing electricity and gas consumption in halls



Graph 4.D.4 Graph showing energy consumption per room in halls

4.E – Appendix E – Energy Initiatives during 2008/9

- The University was successful in applying for funds provided by HEFCE and administered by Salix Finance. We will receive £300,000 for energy-saving projects after putting forward £75,000 of our own funding. The funding is effectively a zero-interest loan, and energy savings made can be re-invested as new capital in future years. The original loan does not need repaying if continued savings can be demonstrated. The £375,000 is to be spent by mid-2010.
- Introducing fresh air cooling to the King's Meadow Campus data centre (£60,000). This is a major project to be completed by November 2009. It will reduce the electrical air-conditioning load to the data centre when outside conditions permit.
- New energy efficient lighting with controls to the corridor areas of all 16 floors of the Tower. This was completed in the Summer of 2009 at a cost of £32,000.
- Purchase of 'Powerman' computer software on behalf of Information Services at a cost of £30,000. This software will enable remote switch-off of all desktop PCs across the University when they are not in use. IS have introduced the remote switch-off on 24-hour student facilities, and are monitoring usage elsewhere pending future action. If extended across all PCs next year as planned, then this technology has the potential to reduce our electricity bill by over hundred thousand pounds per annum.
- A consultancy specialising in utility audits, was commissioned to assess potential overbilling on invoices for the last 6 years on a shared-savings basis. The total value of invoices checked was £26.5million, and the total errors detected were £10,978. The value of errors detected (at 0.04%) compares favourably with typical utilities error rates of 0.5 – 2.0%, validating internal checking and payment processes.
- The Elcomponent MeterRing electricity sub-metering system has now expanded to 286 meters, giving half-hourly readings on most major University buildings. Recent new buildings, such as the Nottingham Geospatial Building and the Clinical Sciences extension at Nottingham City Hospital, have been connected to the system as standard.
- Energy awareness – The Halls energy competition started Oct 08, as in recent years. November 08 was an 'Energy awareness month' with a number of new initiatives.
- The Nottingham Geospatial Building on Jubilee Campus has been rated as BREEAM 'excellent', and has included our first biomass boiler to provide a renewable source of heating.

4.F – Appendix F – Initiatives Planned for 2009/10

A new Director of Sustainability is to be appointed within the Estate Office from December 2009. He will lead a restructured Sustainability Team including both the Environmental and Energy Management disciplines. This will give added focus and drive to all of our initiatives in these areas. As a result, much of our direction and planning is still under review at present, but the following initiatives are already underway:-

- We plan to install modern controls in the Production Engineering building at University Park. This will cost an estimated £30,000 and will provide heating, cooling and humidity control to the existing plant.
- Heating controls are to be fitted to Sutton Bonington Library at an estimated £10,000. This building is one of the larger buildings still remaining on elderly 'stand alone' controls. Fitting modern BMS controls will allow the building control settings to be accessed remotely from the Estate Office.
- An energy management initiative is to begin in the Autumn of 2009 in partnership with the Mark Group. This project will look at targeting our Halls of residence to see what potential energy savings are available, particularly by improved insulation and renewable energy applications.
- Registration for the Carbon Reduction Commitment Energy Efficiency Scheme will begin from April 2010. The government scheme will result in 50,000 organisations reporting on and eventually trading in, carbon emissions. A 'league table' will be published that will rank organisations in order of the carbon reductions they have achieved each year.
- Further applications of new technologies incorporated in planned capital projects including straw bale wall construction at Sutton Bonington.



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