

Energy Report

2006/7

2006/7 Energy Report – Executive Summary

This year saw reductions in energy and water consumption, continuing the downward trend from last year. Energy costs also were reduced from last year's peak.

The annual key performance indicators (KPI's) from this year's report are as follows:-

Energy

Total energy consumption was reduced by 4% year on year.

Energy consumption per square metre reduced by 7.1%.

Energy usage per FT student reduced by 6.4% from last year, to a new low (now 18% lower than in 2002/2003).

Water

Water consumption was reduced by 16%, following on from last year's 8% fall.

Costs

Overall utility costs including taxes fell 20% to £7.55 million

Environmental

Overall CO₂ Emissions reduced by 39%, principally due to increased amounts of 'green' electricity being purchased.

Turnover

The University's turnover has increased by 8.3% during this reporting year. Total utility costs are now 1.97% of turnover.

Premises

The overall premises Gross Internal Area (GIA) has increased by 3.3% over this period. The first full year of occupation of the new School of Veterinary sciences plus the extension to Biomolecular Sciences added an extra 4.8million kWh (2.6%) to overall energy consumption.

Notes to accompany Executive Summary

The strategic management of energy is undertaken by the Environment Committee, chaired by the PVC for Infrastructure.

The membership of the Environment Committee for 2006/7 was as follows:-

Prof Alan Dodson	(AD)	PVC, Chair
Mr Chris Jagger	(CHJ)	Estate Office
Mr Tim Rudge	(TR)	Estate Office
Dr John Sutherland	(JS)	Safety Office
Ms Chloe Cheesman	(SD)	Student Union
Ms Karen Atwood	(KA)	School of Computer Science
Ms Rachel Greatrix	(RG)	School of Nursing
Prof Roy Haines Young	(RHY)	School of Geography
Dr Mandy Roshier	(MR)	School of Veterinary Science
Ms Lynne Tucker	(LT)	Information Services
Mr Martin Suthers	(MS)	Lay Member
Mr Gavin Scott	(GS)	Estate Office

As part of its strategy to control consumption and costs, the Environment Committee appoints an Energy Sub-Group to work in detail on particular areas of energy and water efficiency.

The terms of reference are to:-

- Promote energy conservation schemes which offer attractive payback periods
- Review the best long term strategies for energy provision, considering issues such as decentralisation and combined heat and power
- Continue to use innovative purchasing strategies to obtain the best value energy supply contracts
- Actively seek offers of 'green' electricity
- Liaise with our building users to ensure correct hours of operation of heating and ventilation systems are maintained
- Revisit controls settings in our existing buildings to optimise energy usage and reduce waste
- Explore opportunities for new and renewable energy technologies in new building developments
- Promote energy awareness campaigns throughout all of the University's buildings and Schools (see the website at <http://www.nottingham.ac.uk/estate/environment/>)

Note that most figures relate to the University's financial year of August 1st 2006 to July 31st 2007, with the baseline for comparison being the previous (2005/6) financial year. Utilities continue to be procured via Notice Ltd, which is a wholly owned subsidiary of the University of Nottingham.

2006/7 Energy Report

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Introduction

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 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.

Section 4 – Appendices

Covering the individual accounts billed for electricity, gas and water, plus a record of work undertaken during the year.

Section 1 – Total Energy Report

1.A. - Energy and Water Costs Summary

Energy and water costs were reduced by a significant 17% last year. Whilst some of this was down to the 4% reduction in consumption, most can be attributed to our purchasing strategy. This allowed us to take immediate advantage of the fall in energy prices that occurred between September 2006 and February 2007. Risk-averse institutions using fixed-price contracts will have found their energy costs in 2006/7 to be perhaps 10% higher than for 2005/6.

Energy and Water Costs	2004/5	2005/6	2006/7	Change
				'06/7 to '05/6
University Park	£ 3,043,972	£ 4,697,358	£ 3,844,450	-18%
Sutton Bonington	£ 725,387	£ 1,149,584	£ 960,900	-16%
Jubilee Campus	£ 379,587	£ 530,352	£ 513,198	-3%
Others	£ 292,862	£ 486,098	£ 465,405	-4%
Medical School	£ 1,026,500	£ 1,378,232	£ 1,055,068	-23%
Total	£ 5,468,308	£ 8,241,624	£ 6,839,021	-17%

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

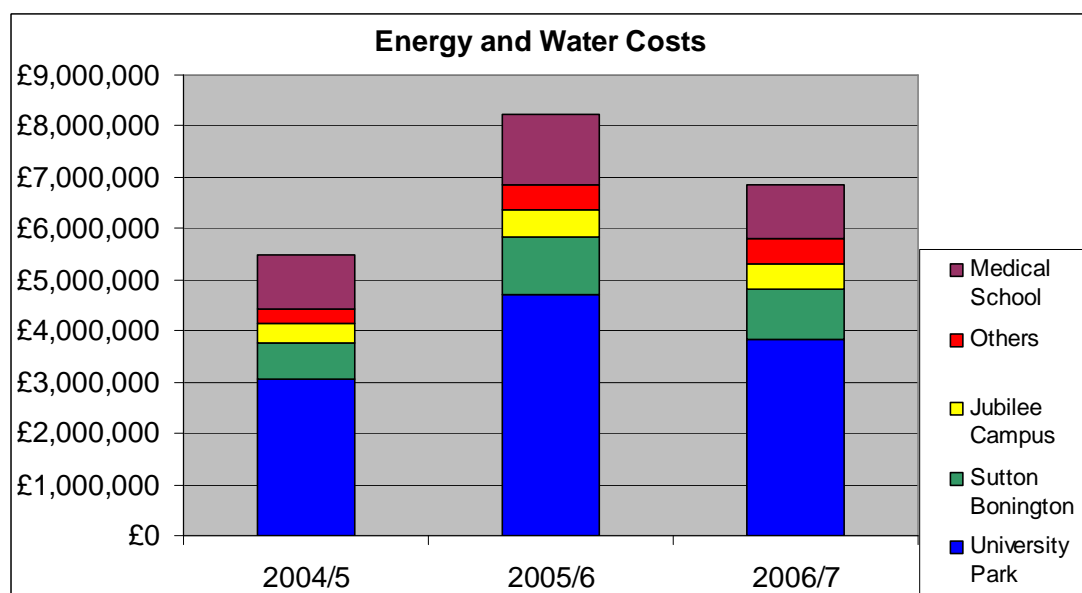


Figure 1.A.2 Graph of energy and water costs for the last 3 years split by campus.

Note that these figures exclude VAT and Climate Change Levy, which are discussed on page 7.

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

Campus Costs	Floor Area	Cost/sq.m/annum			
		Electricity	Heating	Water	Total
University Park	310,953	£7.33	£2.96	£2.07	£12.36
Sutton Bonington	52,132	£10.83	£4.65	£2.95	£18.43
Jubilee Campus	45,601	£6.15	£1.67	£3.43	£11.25
Others	39,442	£7.75	£2.71	£1.34	£11.80
Medical School	49,960	£11.46	£8.35	£1.31	£21.12
Total	498,088	£8.04	£3.54	£2.15	£13.73

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

The overall floor area increased by 3.5% from 2004/5.

Note that if taxes are taken into account, our average utility costs are now £15.16 per square metre per annum.

1.C - Climate Change Levy and VAT

The total amount of CCL paid by Notice Ltd during 2006/7 was £33,000 for electricity and £69,000 for gas. This was a £178,000 saving on last year due to the increased amounts of 'green' electricity that was procured.

In the majority of tables in this report VAT is also not included. However for completeness some tables have VAT shown where indicated. VAT paid for 2006/7 FY was £608,000 (£158,000 gas and £450,000 on electricity).

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

	2006/7				2005/6
	Electricity	Fossil Fuels	Water	Totals	Totals
Energy Costs	£ 4,002,149	£ 1,764,292	£ 1,072,580	£ 6,839,021	£8,241,624
Climate Change Levy	£ 33,431	£ 68,628	£ -	£ 102,059	£302,620
Value Added Tax	£ 449,721	£ 158,479	£ -	£ 608,200	£921,029
Total	£ 4,485,301	£ 1,991,399	£ 1,072,580	£ 7,549,280	£9,465,273

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

The Climate Change Levy (CCL) was introduced in April 2001. This is an energy tax of 0.154p/kWh on gas and 0.441p/kWh on the electricity costs of all non-residential properties, although 'green' electricity is exempt.

1.D - 2006/2007 Costs Broken Down by Campus and Utilities

Energy and Water Costs	Electricity	Fossil Fuels	Water	Total
University Park	£ 2,278,818	£ 921,632	£ 644,000	£ 3,844,450
Sutton Bonington	£ 564,816	£ 242,356	£ 153,728	£ 960,900
Jubilee Campus	£ 280,469	£ 76,186	£ 156,543	£ 513,198
Others	£ 305,536	£ 107,072	£ 52,797	£ 465,405
Medical School	£ 572,510	£ 417,046	£ 65,512	£ 1,055,068
Total	£ 4,002,149	£ 1,764,292	£ 1,072,580	£ 6,839,021

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

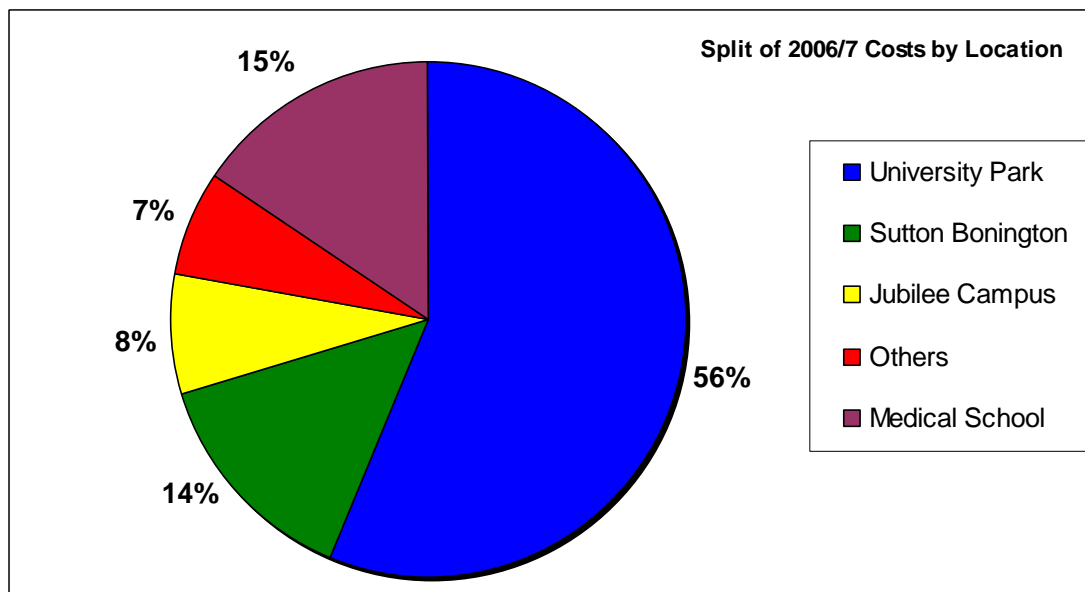


Figure 1.D.2 Pie chart of energy and water costs split by campus

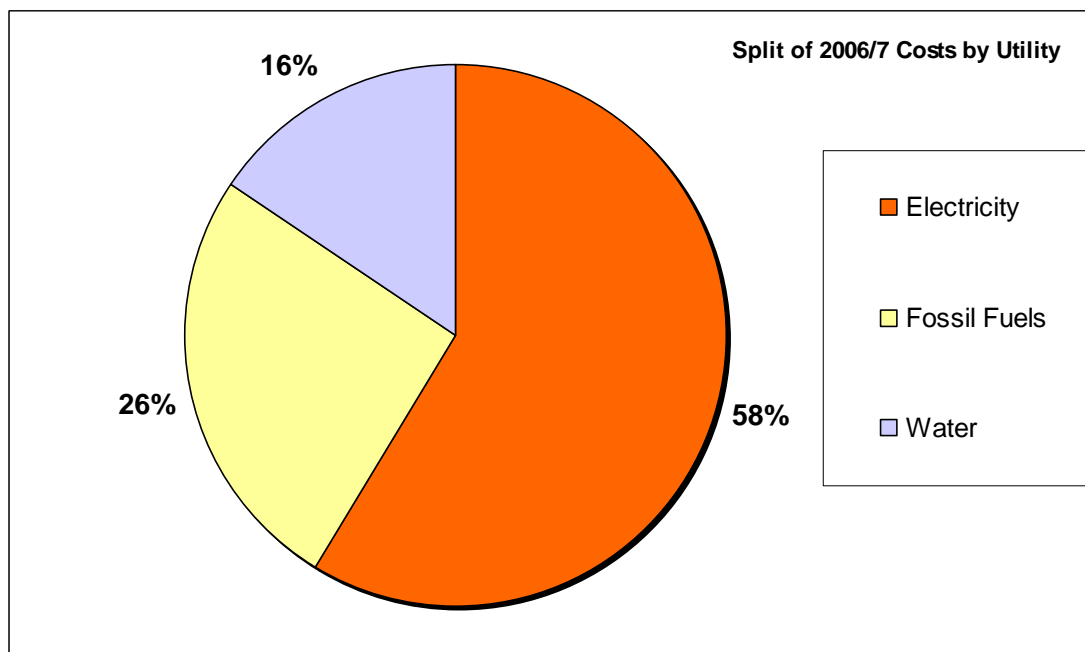


Figure 1.D.3 Pie chart of energy and water costs split by utility type

1.E - Energy Use Summary

Overall energy consumption reduced by 4% in 2006/7, on top of last year's reduction of 3%. Whilst electricity consumption remained level, consumption of fossil fuels was down 7%. The weather was markedly warmer in 2006/7, the degree-day data in section 3C showing that a reduction of about 8% in overall energy consumption could have been expected on a like-for-like basis. However, floor area was up 3.5%, and out-of-office hours usage of buildings continued to increase.

Energy Consumption	MWh	MWh	MWh	Change
	2004/5	2005/6	2006/7	'06/7 to '05/6
University Park	116,269	109,088	102,232	-6%
Sutton Bonington	26,706	25,818	26,000	1%
Jubilee Campus	10,396	9,939	9,553	-4%
Others	10,404	10,544	10,607	1%
Medical School	34,150	36,516	35,738	-2%
Total	197,924	191,905	184,130	-4%

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

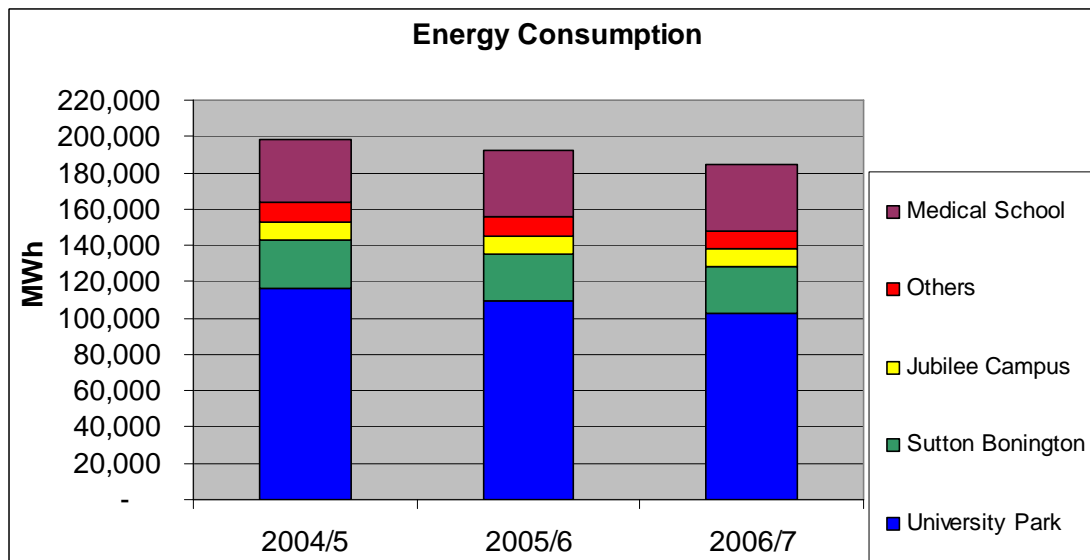


Figure 1.E.2 Graph of energy consumption for the last 3 years split by campus

1.F - Energy Use Breakdown by Campus and Utilities

Energy Consumption	MWh		MWh
	Electricity	Fossil Fuels	Total
2006/2007			
University Park	43,784	58,448	102,232
Sutton Bonington	10,536	15,463	26,000
Jubilee Campus	5,047	4,506	9,553
Others	4,727	5,880	10,607
Medical School	10,328	25,410	35,738
Total	74,422	109,708	184,130

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

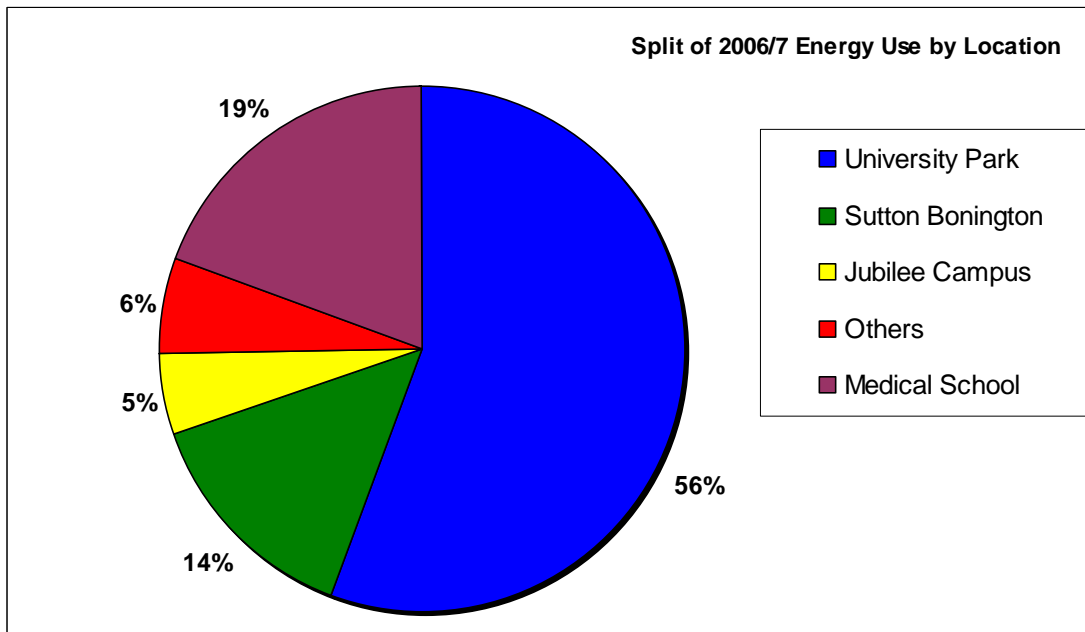


Figure 1.F.2 Pie chart of energy consumption split by campus

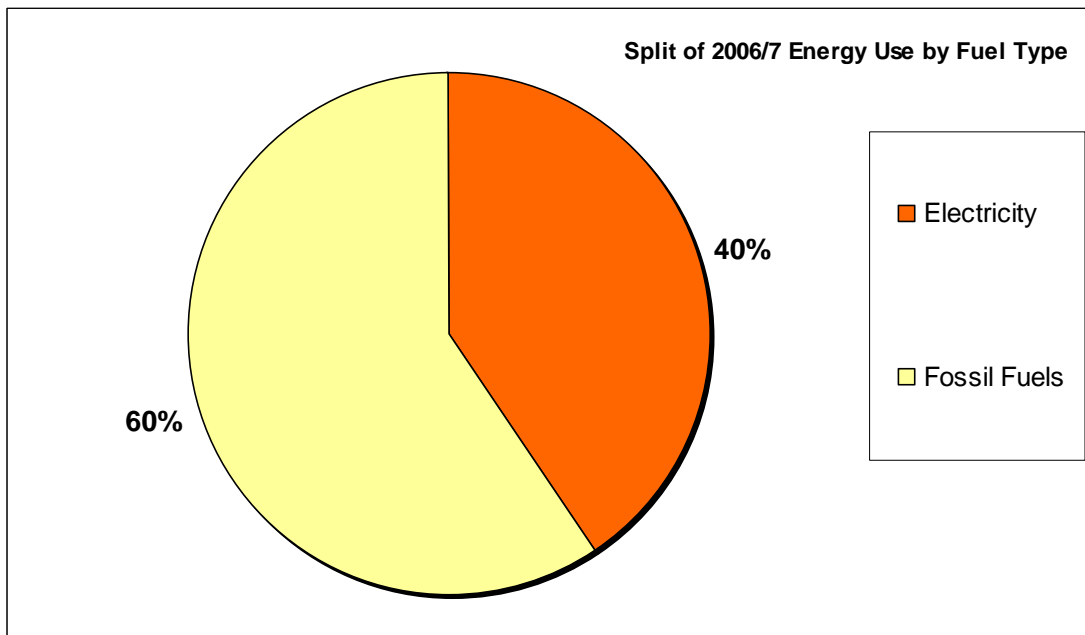


Figure 1.F.3 Pie chart of energy consumption split by utility type.

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

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

	2003/4	2004/5	2005/6	2006/7	Change
Floor Area (sq.m.)	436,236	465,769	482,144	498,088	3.3%
Annual Energy Usage (MWh)	182,602	197,924	191,905	184,130	-4.1%
Energy Usage Per sq. m.	419	425	398	370	-7.1%

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

Note that energy usage has fallen below 400kWh per square metre.

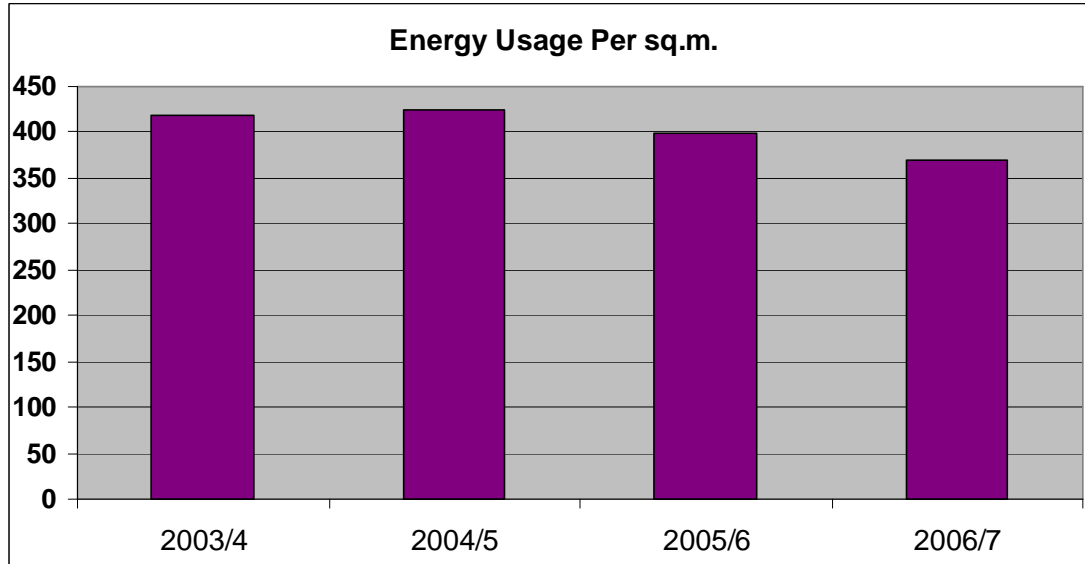


Figure 1.G.2 Graph of last four years energy usage per unit floor area.

	2003/4	2004/5	2005/6	2006/7	Change
Floor Area (sq.m.)	436,236	465,769	482,144	498,088	3.3%
Energy and Water Costs	£ 4,181,182	£ 5,468,308	£ 8,241,624	£ 6,839,021	-17.0%
Utility Cost Per sq. m.	£ 9.58	£ 11.74	£ 17.09	£ 13.73	-19.7%

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

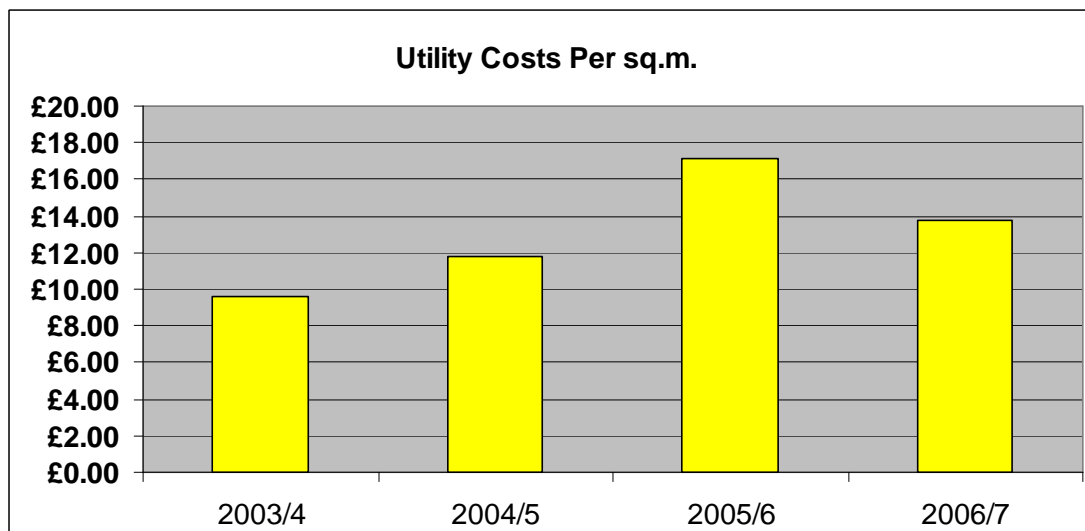


Figure 1.G.4 Graph of last four years energy and water costs normalised by floor area.

1.H - Energy Usage and Cost per FT Student

	2003/4	2004/5	2005/6	2006/7	'06/7 to '05/6
FT Student Numbers	22,808	23,740	24,680	25,308	2.5%
Annual Energy (MWh)	182,602	197,924	191,905	184,130	-4.1%
Energy / Student (kWh)	8,006	8,337	7,776	7,276	-6.4%

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

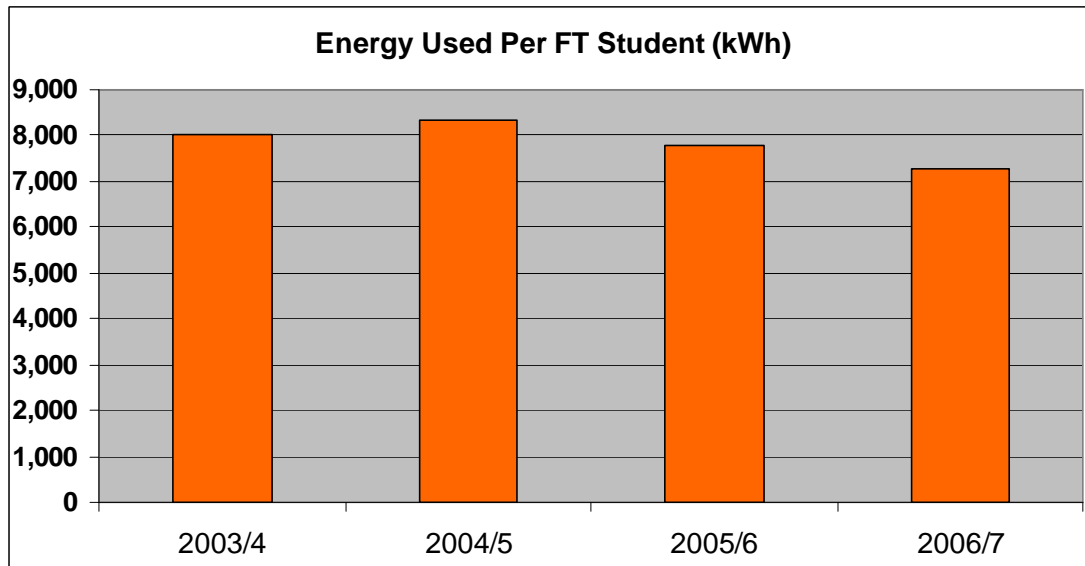


Figure 1.H.2 Graph of last four years energy usage per full-time student.

	2003/4	2004/5	2005/6	2006/7	'06/7 to '05/6
FT Student Numbers	22,808	23,740	24,680	25,308	2.5%
Energy and Water Costs	£ 4,181,182	£ 5,468,308	£ 8,241,624	£ 6,839,021	-17.0%
Utility Costs / Student	£ 183.32	£ 230.34	£ 333.94	£ 270.23	-19.1%

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

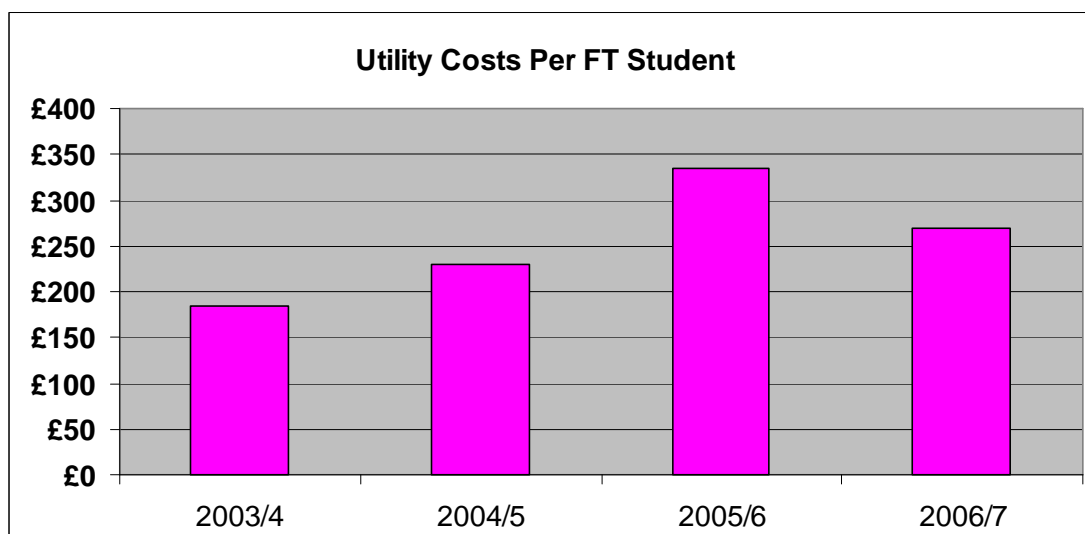


Figure 1.H.4 Graph of last four years energy and water costs per full-time student.

Note: The statistics on student numbers above are provided by the Policy and Planning Unit, Registrar's Department. They exclude students not currently studying in Nottingham.

1.I - Utility Costs as a Proportion of University Turnover

Percentage of Turnover (£ 000)	2003/4	2004/5	2005/6	2006/7	Change '06/7 to '05/6
Utility Costs inc. taxes	£ 4,953	£ 6,156	£ 9,465	£ 7,549	-20.2%
Total University Turnover	£ 303,500	£ 326,400	£ 353,944	£ 383,351	8.3%
Percentage	1.63%	1.89%	2.67%	1.97%	-26.4%

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

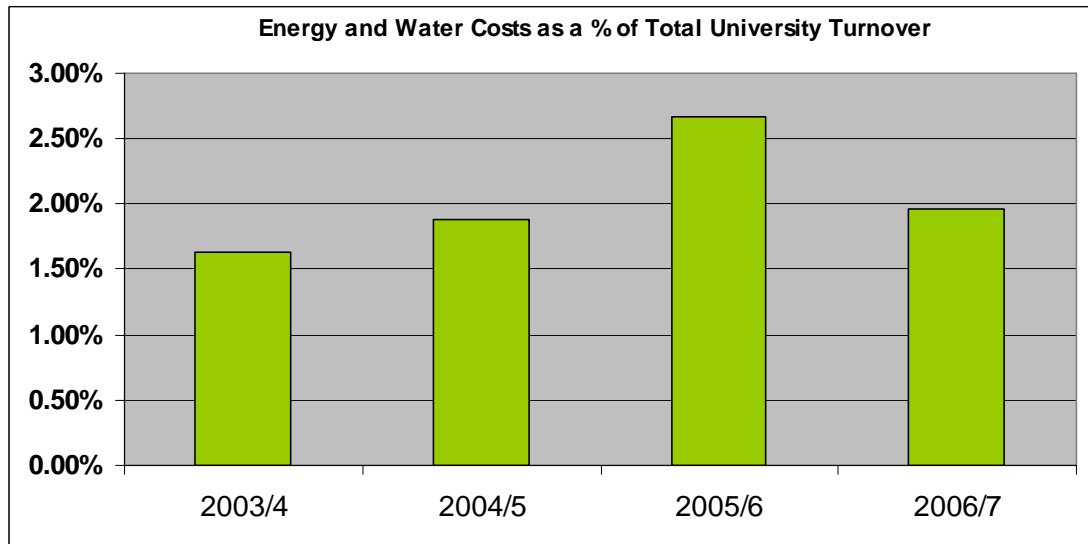


Figure 1.I.2 Graph of last four years energy and water costs normalised by total University turnover.

1.J – Comparison to Other Universities – 2005/6

	Energy use/ student (kWh)	Energy/sq.m (kWh/sq.m GIA) non- residential	Utility Costs/ income
Birmingham	7,659	524	2.91%
Cambridge	7,693	306	0.93%
Cardiff	1,975	183	2.02%
Edinburgh	7,197	324	2.18%
Glasgow	5,226	335	1.54%
Imperial College	21,999	611	2.34%
King's College London	7,546	443	1.71%
L.S.E	2,877	306	1.48%
Leeds	4,950	345	3.07%
Liverpool	6,794	345	2.43%
Manchester	5,642	344	2.24%
Newcastle Upon Tyne	6,009	340	2.00%
Nottingham	4,990	423	3.00%
Oxford	8,091	372	1.23%
Sheffield	3,762	282	1.93%
Southampton	6,479	515	1.84%
U.C.L.	6,273	324	1.80%
Warwick	6,896	497	1.90%
Queen's University Belfast	2,883	259	1.75%

Figure 1.J.1 Table of Estates Management Statistics for the 2005/6 financial year.

The statistics in table 1.J.1 provide a range of comparators to other major Universities, as reported in the EMS returns for 2005/6. 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.

Energy use per m² at Nottingham is high compared to other institutions in the Russell Group; this in part reflects the higher utilisation of space at Nottingham. Non-residential space per student is just 11.8m² at Nottingham, compared to an average of 14.8m² for the Russell Group (excluding London institutions, Oxford, and Cambridge). This difference of approximately 20% represents a more intensively used estate.

Utility costs as a percentage of income are high for Nottingham compared to other institutions – 3.0% compared to an average of 2.25% (Russell Group excluding London institutions, Oxford, and Cambridge). There are differences in the EMS return definitions for utility costs compared to section 1.I of this report, which include CCL and taxes.

Section 2 – Analysis of Energy Components

2.A - Electricity Consumption

Electricity consumption was held steady this year, following on from increases of 8% and 4% in the previous two years.

This improvement in performance was particularly encouraging in the light of continued expansion such as the new School of Veterinary Sciences and the extension to the Centre for Bio-Molecular Sciences (overall increase of 3% in floor area).

The increase listed under 'Others' is due to increased consumption at the King's Meadow Campus (up 23%) which falls within this category. This is due to the relocation of much of the University's support facilities, and in particular Information Services, from University Park.

Electricity Consumption	MWh	MWh	MWh	Change	Floor Area (m2)
	2004/5	2005/6	2006/7	'06/7 to '05/6	
University Park	43,245	44,380	43,784	-1%	310,953
Sutton Bonington	10,215	10,475	10,536	1%	52,132
Jubilee Campus	5,091	4,912	5,047	3%	45,601
Others	3,020	4,134	4,727	14%	39,442
Medical School	9,900	10,204	10,328	1%	49,960
Total	71,471	74,105	74,422	0%	

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

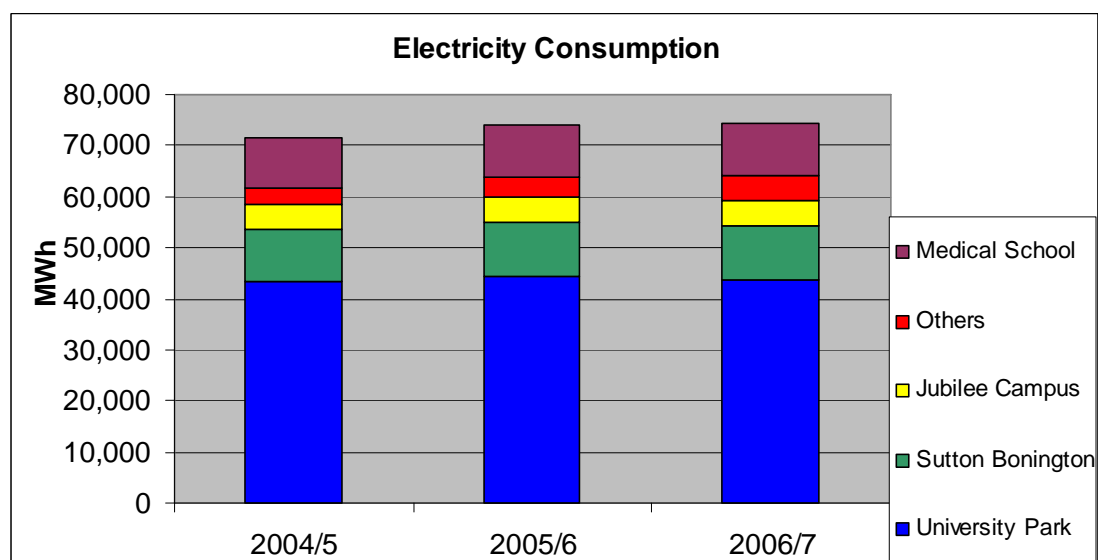


Figure 2.A.2 Graph of electricity usage for the last 3 years split by campus.

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

2.B - Electricity Costs

Flexible purchasing was first adopted by Nottingham University in October 2005 at its larger sites, and for that contract year savings of 6.9% (£328,000) were achieved compared to using a quoted fixed price contract. Prices varied from month to month according to market prices, but the overall average received was 6.18p/kWh.

Following on from this success, a similar arrangement was used for the period commencing October 2006. The results were even more impressive, as we were able to immediately benefit from the large falls in energy prices that occurred between September 2006 and February 2007. The average price for electricity purchased through this contract was 4.95p/kWh across the contract year. This includes additional costs for purchasing 'green' electricity (0.45p/kWh).

The tender for the University's 'sub-100kW' sites (representing 36 smaller properties, such as sports grounds) was awarded to Eon to commence April 1st 2006. This was a two-year contract with the price averaging 7.97p/kWh.

Electricity Costs	2004/5	2005/6	2006/7	Change '06/7 to '05/6
University Park	£ 1,727,374	£ 2,522,336	£ 2,278,818	-10%
Sutton Bonington	£ 406,862	£ 614,473	£ 564,816	-8%
Jubilee Campus	£ 205,062	£ 300,457	£ 280,469	-7%
Others	£ 158,094	£ 286,388	£ 305,536	7%
Medical School	£ 401,000	£ 463,000	£ 572,510	24%
Total	£ 2,898,392	£ 4,186,654	£ 4,002,149	-4%

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

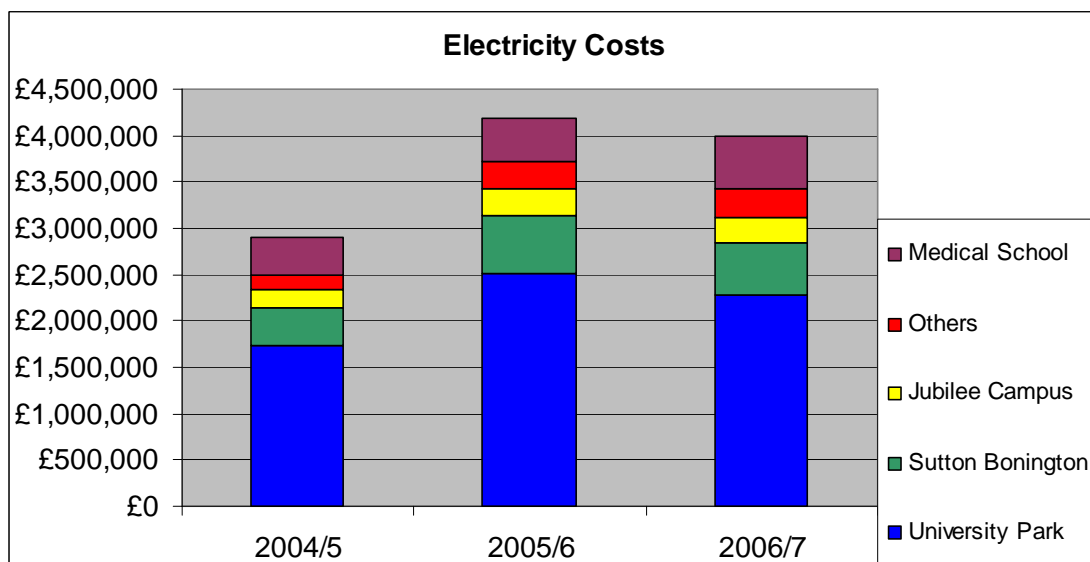


Figure 2.B.2 Graph of electricity costs for the last 3 years split by campus.

2.C - Fossil Fuel Consumption

Consumption of fossil fuels fell by 7% in 2006/7, on top of a similar reduction in 2005/6.

Sutton Bonington Campus showed a 1% increase, due to the opening of the new School of Veterinary Science which added 1,400 MWh to the total. Without the addition of the new building, Sutton Bonington would have shown an 8.5% fall.

Similarly, the large extension to the Centre for Bio-Molecular Sciences at University Park added 939MWh of new consumption to the total.

Fossil Fuel Consumption	MWh 2004/5	MWh 2005/6	MWh 2006/7	Change '06/7 to '05/6	Floor Area (m ²)
University Park	73,024	64,708	58,448	-10%	310,953
Sutton Bonington	16,491	15,343	15,463	1%	52,132
Jubilee Campus	5,305	5,027	4,506	-10%	45,601
Others	7,383	6,410	5,880	-8%	39,442
Medical School (Steam)	24,250	26,312	25,410	-3%	49,960
Total	126,452	117,800	109,708	-7%	

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

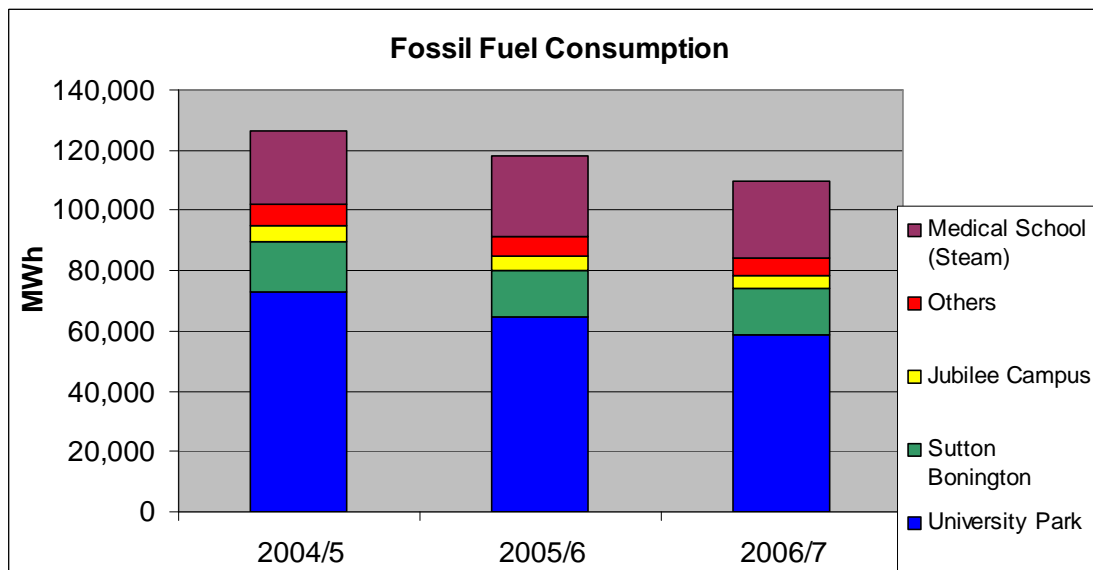


Figure 2.C.2 Graph of fossil fuel usage for the last 3 years split by campus.

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

2.D - Fossil Fuel Costs

Flexible purchasing was first adopted by Nottingham University in October 2005, and for that contract year savings of 10.3% (£272,000) were achieved compared to using a quoted fixed price contract. Prices varied from month to month according to market prices, but the overall average received was 2.346p/kWh.

Following on from this success, a similar arrangement was used for the period commencing October 2006. The results were even more impressive, as we were able to immediately benefit from the large falls in energy prices that occurred between September 2006 and February 2007. The average price for gas was 1.48p/kWh across the contract year.

Fossil Fuel Costs	2004/5	2005/6	2006/7	Change '06/7 to '05/6
University Park	£ 685,857	£ 1,507,478	£ 921,632	-39%
Sutton Bonington	£ 168,360	£ 349,059	£ 242,356	-31%
Jubilee Campus	£ 55,188	£ 116,892	£ 76,186	-35%
Others	£ 87,803	£ 148,485	£ 107,072	-28%
Medical School (Steam)	£ 567,000	£ 849,032	£ 417,046	-51%
Total	£ 1,564,208	£ 2,970,946	£ 1,764,292	-41%

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

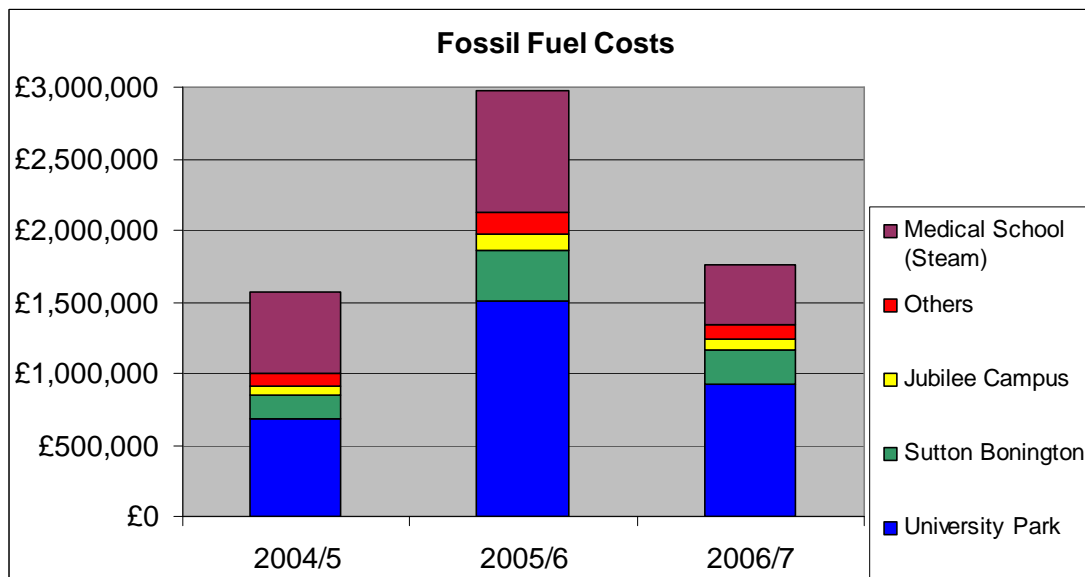


Figure 2.D.2 Graph of fossil fuel costs for the last 3 years split by campus.

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 for 2006/7 showed an overall reduction of 16%, on top of the previous year's 8% fall. The main reductions occurred at University Park and Sutton Bonington. Two main factors were behind the reductions; the completion of our programme of installing urinal controls, and the detection and repair of mains leaks.

It is encouraging to think that we are now using over 200,000 cubic metres less of water per annum than two years ago, whilst operating a larger estate.

Water Consumption	cubic m. 2004/5	cubic m. 2005/6	cubic m. 2006/7	Change '06/7 to '05/6	Floor Area (m2)
University Park	608,444	546,497	473,754	-13%	310,953
Sutton Bonington	148,732	162,052	102,870	-37%	52,132
Jubilee Campus	86,869	76,534	75,818	-1%	45,601
Others	37,975	22,987	20,940	-9%	39,442
Medical School	43,570	43,118	43,628	1%	49,960
Total	925,590	851,188	717,010	-16%	

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

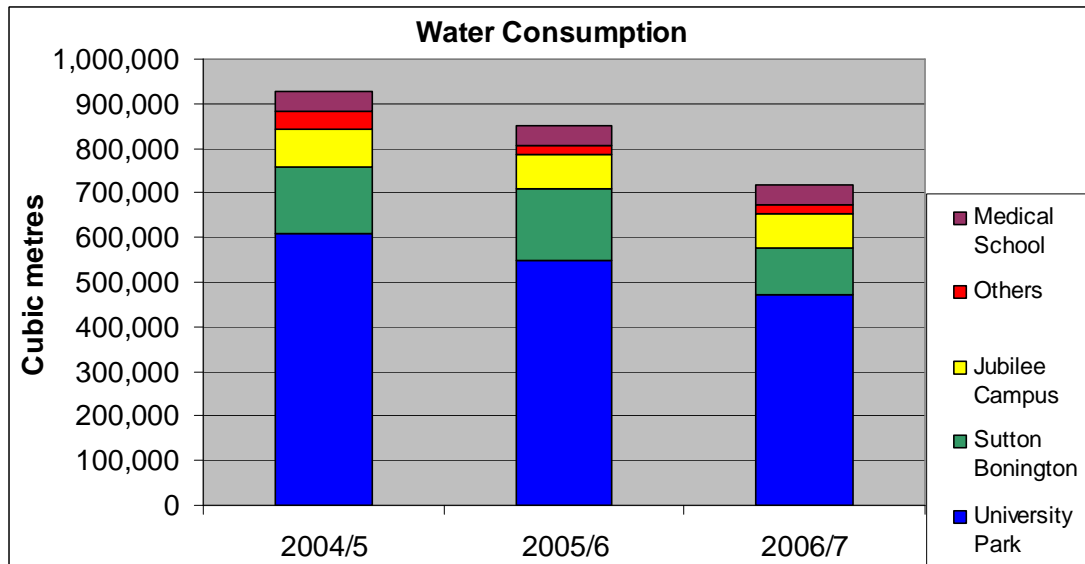


Figure 2.E.2 Graph of water usage for the last 3 years split by campus.

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 7.5% in April 2007, on top of the previous year's rise of 16%. As in 2006, the price rises were most significant for the elements of sewerage and surface water drainage.

The price of water plus sewerage at smaller sites rose 6.6% in April 2007 from £1.82/m³ to £1.94p/m³. At University Park (ECO 250 Tariff), the price of winter water rose 5.0% in April 2007 from 39.21p/m³ to 41.16p/m³. Summer water (May to September) rose 3.1%, from 74.54p/m³ to 76.83 p/m³. Sewerage rates were up 7.8%, from 67.82 p/m³ to 73.16p/m³.

Surface water drainage, which is usually based on site area, went up 7.9%, for instance from £89,873 to £96,973.40 at University Park.

Water Costs				Change
	2004/5	2005/6	2006/7	'06/7 to '05/6
University Park	£ 630,741	£ 667,544	£ 644,000	-4%
Sutton Bonington	£ 150,165	£ 186,052	£ 153,728	-17%
Jubilee Campus	£ 119,337	£ 113,003	£ 156,543	39%
Others	£ 46,965	£ 51,225	£ 52,797	3%
Medical School	£ 58,500	£ 66,200	£ 65,512	-1%
Total	£ 1,005,708	£ 1,084,024	£ 1,072,580	-1%

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

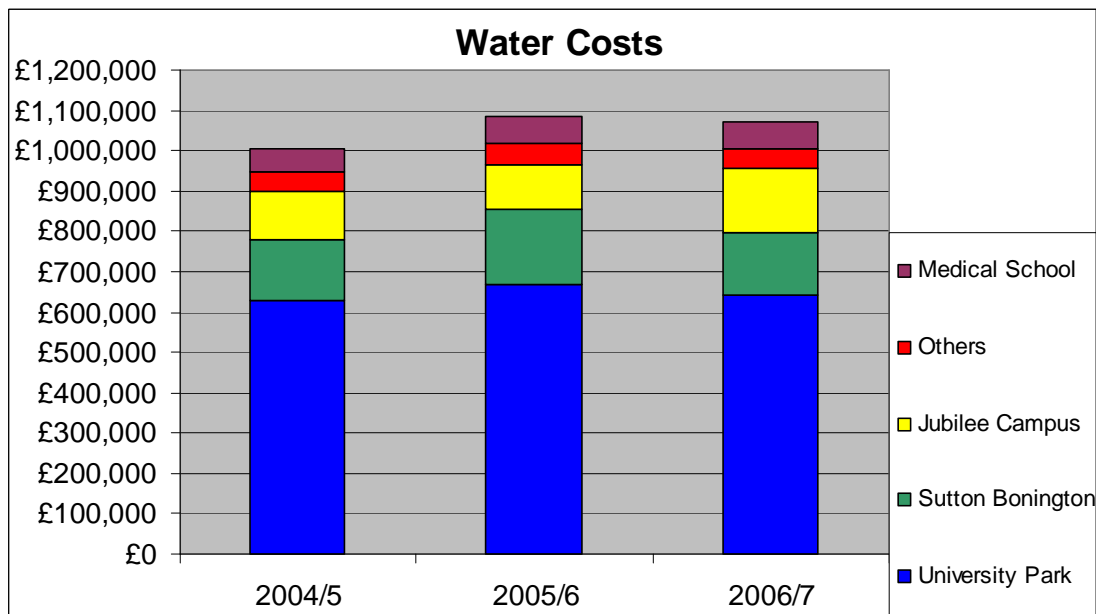


Figure 2.F.2 Graph of water costs for the last 3 years split by campus.

Section 3 – Environmental Considerations

3.A - Carbon Dioxide Emissions

Overall emissions of carbon dioxide from all sources dipped during 2006/7, as the University was able to procure 'green' renewable electricity from Gaz de France at our major sites. The larger emissions for 2005/6 were due to no source of 'green' electricity being available for our larger sites.

University Park is included in the EU Emissions Trading Scheme – the calendar year of 2006 was the second year of operation of the Scheme. The University beat its target of 13,569 Tonnes by 2,209 Tonnes (16.3%), emitting 11,360 Tonnes of CO₂ from the campus. Note that this scheme only covers fossil fuel emissions from University Park and covers the calendar year, unlike the tables and graphs here which show the University's financial year.

CO2 Emissions	Tonnes	Tonnes	Tonnes	Change	Floor Area (m2)
	2004/5	2005/6	2006/7	'06/7 to '05/6	
University Park	18,658	28,419	14,243	-50%	310,953
Sutton Bonington	3,581	6,721	3,693	-45%	52,132
Jubilee Campus	2,188	2,740	1,552	-43%	45,601
Others	2,205	2,640	2,015	-24%	39,442
Medical School	8,013	8,509	8,381	-2%	49,960
Total	34,645	49,030	29,883	-39%	

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

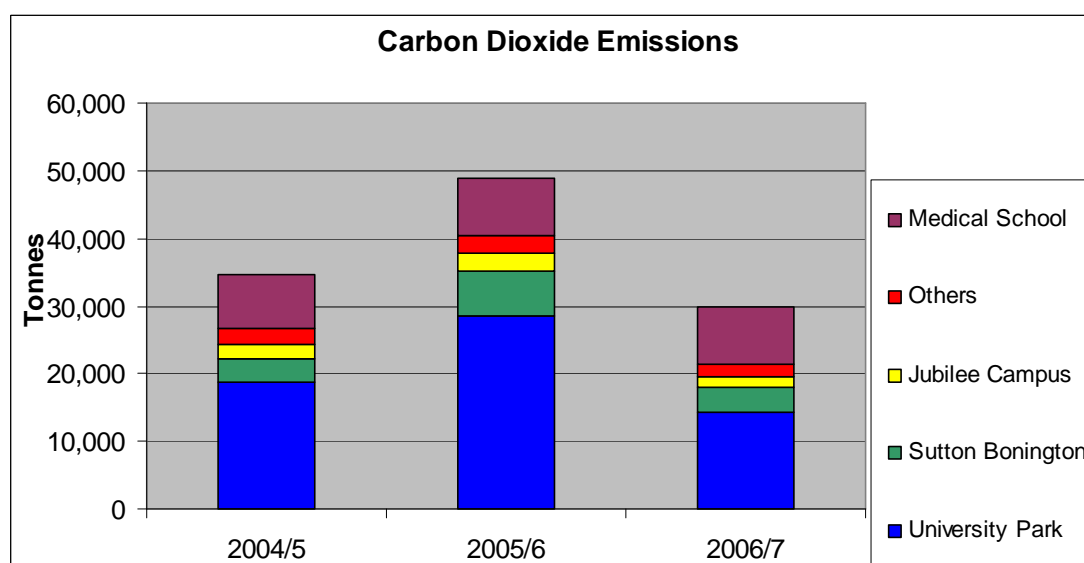


Figure 3.A.2 Graph of CO₂ emissions for the last 3 years split by campus.

Conversion factors used are supplied to us by the Carbon Trust - units are Tonnes of Carbon Dioxide emitted per MWh of energy consumed. Note that DEFRA (the Department for Environment, Food and Rural Affairs) are now recommending that for electricity a constant conversion value is used until 2010, although real emissions vary year on year due to the different mix of fuels used in power stations nationally.

Carbon Dioxide (CO₂) is released into the atmosphere when fossil fuels are burned, and is considered the most important of the 'greenhouse' gases – gases that are thought to be responsible for a man-made warming of the atmosphere. The UK government has a target of reducing national CO₂ emissions by 12.5% from 1990 levels by 2010.

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

CO2 Emissions	Tonnes	Tonnes	Tonnes
2006/2007	Electricity	Fossil Fuels	Total
University Park	3,138	11,105	14,243
Sutton Bonington	755	2,938	3,693
Jubilee Campus	695	856	1,552
Others	898	1,117	2,015
Medical School	3,553	4,828	8,381
Total	9,039	20,845	29,883

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

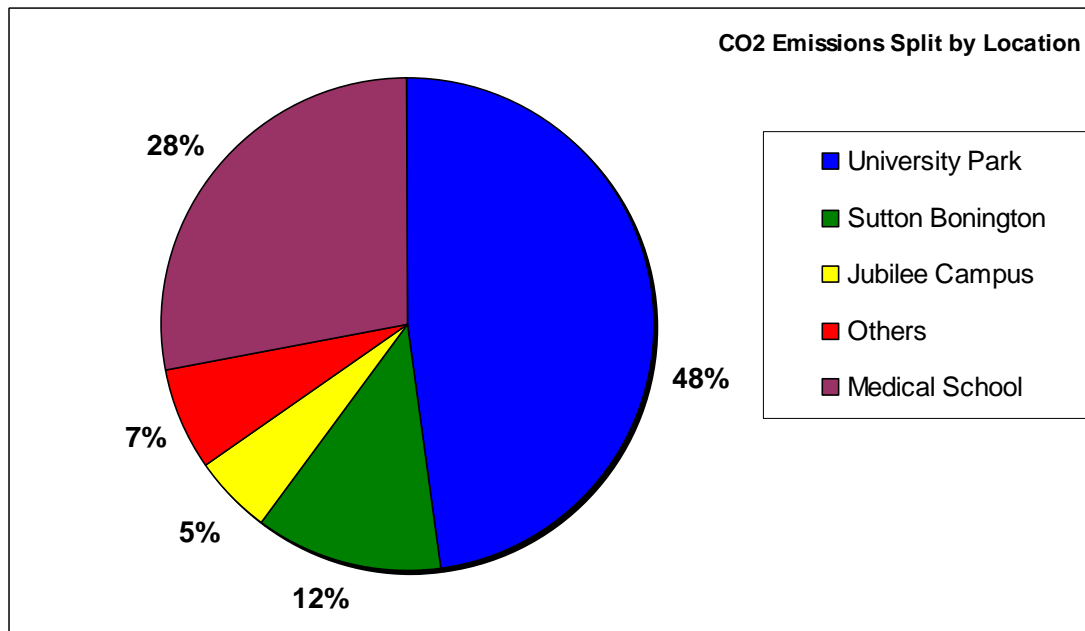


Figure 3.B.2 Graph of CO₂ emissions split by campus

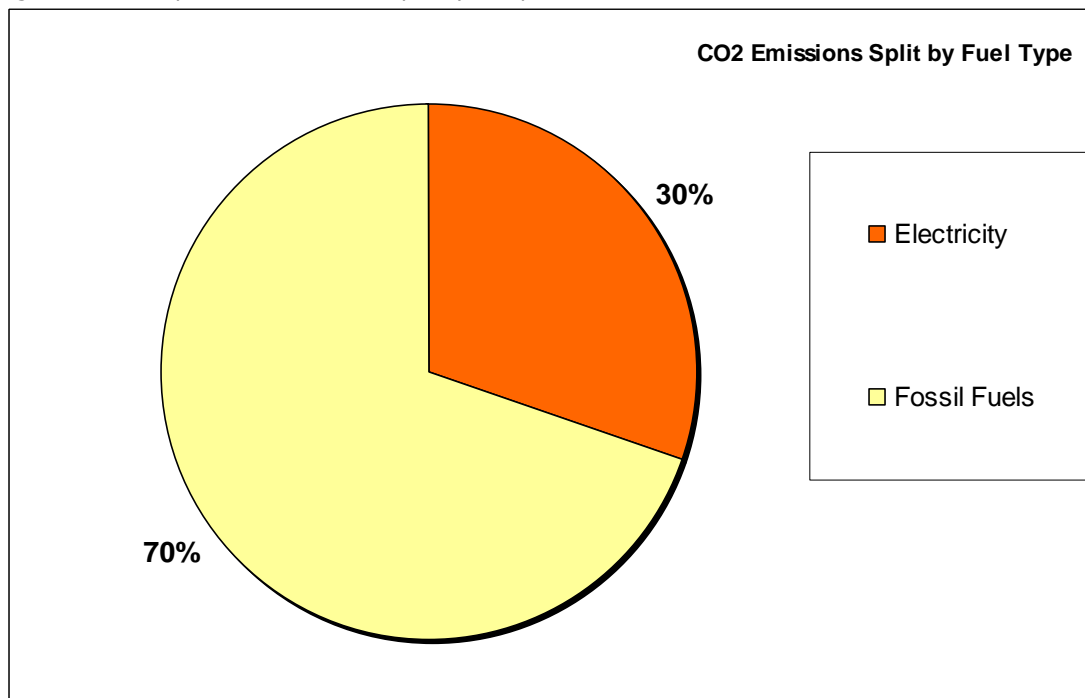


Figure 3.B.3 Graph of CO₂ emissions split by source fuel type

3.C - Weather Data – Degree Days

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 2004-05	Deg. Days 2005-06	Deg. Days 2006-07	'06/7 to '05/6 Change
Aug	35	18	33	27	-18.2%
Sep	76	52	52	24	-53.8%
Oct	162	154	90	88	-2.2%
Nov	270	241	280	227	-18.9%
Dec	338	310	345	295	-14.5%
Jan	362	309	353	269	-23.8%
Feb	312	325	328	272	-17.1%
Mar	283	265	337	264	-21.7%
Apr	217	198	215	133	-38.1%
May	137	139	114	127	11.4%
Jun	74	55	43	49	14.0%
Jul	35	30	12	32	166.7%
Total	2,301	2,096	2,202	1,807	-17.9%
			Weather modifier (75%)		-13.5%

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

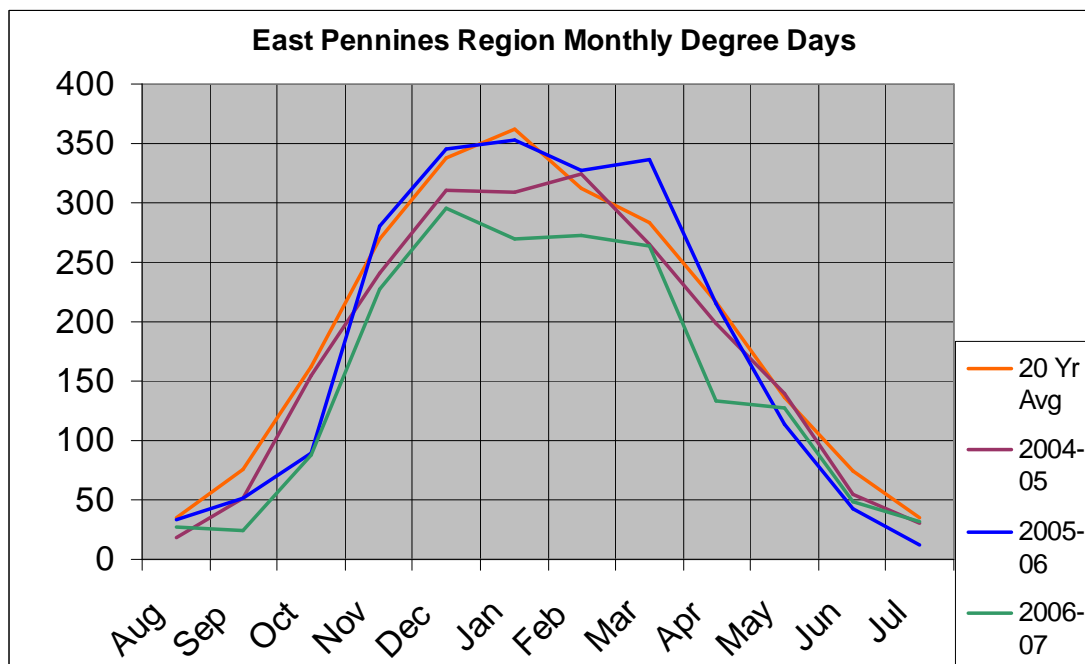


Figure 3.C.2 Graph showing last three years monthly degree days and average degree days

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. Using this information indicates consumption of fossil fuels should have increased by about 13% as 2006/7 was significantly milder than 2005/6.

Section 4 – Appendices

4.A - Appendix A – Electricity Data

Electricity Invoices			2006/7	2005/6	% change	2006/7	2005/6	% change	
Main Campus			kWh	kWh	kWh	£	£	£	
University Park	1000	S4	43,712,298	44,330,935	-1%	2,273,184	2,519,398	-10%	
Lenton Eaves Cottage No.2	2243	01	35,219	17,595	100%	2,699	1,122	141%	
Lenton Lodge	2251	##	29,282	27,293	7%	2,244	1,425	57%	
Lenton Eaves Cottage No.1	2243	01	6310	3,855	64%	547	266	106%	
Redcourt Lodge	2222	##	1,048	804	30%	144	125	15%	
Total of 5 accounts	Totals		43,784,157	44,380,482	-1%	2,278,818	2,522,336	-10%	
Electricity Invoices			2006/7	2005/6	% change	2006/7	2005/6	% change	
Sutton Bonington			kWh	kWh	kWh	£	£	£	
Sutton Bonington Campus	6800	S4	10,036,282	10,187,245	-1%	527,690	597,429	-12%	
New Dairy	##		330,497	98,399	236%	25,039	4,091	512%	
Eviton House (68 College Road)	5891	##	50,000	100,000	-50%	3,000	7,000	-57%	
Animal Research Unit (MLC)	5433	##	29,431	25,640	15%	2,255	1,043	116%	
St.Michael's House (Flats 1-5)	6841	##	16,900	18,107	-7%	650	844	-23%	
St.Michael's Flats Nos 8&9	6843	##	17,153	-8,336	-306%	1,274	-273	-567%	
Manor Farm NU Press 2	6910	##	11,576	3,044	280%	926	246	276%	
St.Michael's Flats Nos 6&7	6842	##	10,947	10,967	0%	838	561	49%	
Manor Farm NU Press 1	6910	##	6,172	1,878	229%	524	159	230%	
45 College Road	6815	##	5,246	8,959	-41%	439	486	-10%	
40 College Road	6811	##	4,491	5,461	-18%	386	302	28%	
50 College Road	6819	##	4,407	3,288	34%	380	235	62%	
24 College Road	6805	##	4,230	3,497	21%	367	240	53%	
St.Michael's Close (Flats 10-15)	6840	##	4,137	3,077	34%	361	226	60%	
44 College Road	6814	##	2,551	-212	-1303%	250	80	213%	
New Dairy Herdsman's House	##		2,338	5,691	-59%	309	350	-12%	
Bunny Park Farm	6860	##	8	-4,153	-100%	13	114	-89%	
Field 25	5671	##	0	0	#DIV/0!	0	500	-100%	
Manor Farm 3 Pump House Kingst	6910	##	0	8,145	-100%	64	446	-86%	
Manor Farm Soar Irrig. Pump Kegw	6910	##	0	3,864	-100%	51	394	-87%	
Total of 20 accounts	Totals		10,536,366	10,474,561	1%	£564,816	£614,473	-8%	
Electricity Invoices			2006/7	2005/6	% change	2006/7	2005/6	% change	
Jubilee Campus			kWh	kWh	kWh	£	£	£	
Jubilee Campus	7000	S4	4,140,523	3,944,260	5%	226,592	236,234	-4%	
Newark & Southwell Halls	7000	S4	735,642	776,420	-5%	39,862	50,152	-21%	
Jubilee Sports Centre	7301	S4	171,043	168,616	1%	14,015	13,008	8%	
Triumph House	6701	##	0	22,673	-100%	0	1,063	-100%	
Total of 4 accounts	Totals		5,047,208	4,911,969	3%	£280,469	£300,457	-7%	
Electricity Invoices			2006/7	2005/6	% change	2006/7	2005/6	% change	
Others			kWh	kWh	kWh	£	£	£	
King's Meadow Campus	6901	S4	2,516,639	2,046,139	23%	161,569	143,525	13%	
Clinical Sciences (City Hospital)	3325	E3	1,046,165	1,044,970	0%	69,000	76,000	-9%	
Derby Medical School	3561	S4	831,339	821,186	1%	49,948	54,351	-8%	
14-22 Shakespeare Street	6101	##	87,629	63,605	38%	6,586	3,144	109%	
Sports Ground - Highfields	6311	##	30,596	7,967	284%	2,342	749	213%	
Unit 6, William Lee Buildings	6883	##	28,855	26,210	10%	2,205	1,406	57%	
Unit 5, William Lee Buildings	6885	##	27,913	28,608	-2%	2,142	1,522	41%	
Unit 8, Edison Village (Synergy Hou	6891	##	26,897	0	#DIV/0!	1,866	0	#DIV/0!	
Unit 8, William Lee Buildings	6884	##	25,541	25,226	1%	1,971	1,363	45%	
Clumber Lodge	6900	##	24,975	19,706	27%	1,964	862	128%	
Boat House	6321	##	20,000	-70	-28671%	1200	25	4700%	
Grove Farm - Old Farmhouse	6121	##	17,429	3,102	462%	1362	467	192%	
Grove Farm	6123	##	16,474	9,072	82%	1291	686	88%	
8 Peachey Street	6102	##	16,375	15,809	4%	1283	883	45%	
Grove Farm - Changing Rooms	6122	##	9973	22,900	-56%	807	1405	-43%	
Total of 15 accounts			4,726,800	4,134,430	14%	£305,536	£286,388	7%	
Electricity Invoices			2006/7	2005/6	% change	2006/7	2005/6	% change	
Medical School			kWh	kWh	kWh	£	£	£	
Medical School			8,006,364	7,920,000	1%	451,645	365,000	24%	Jul 07 estd
Embedded Units (Q.M.C.)			2,321,387	2,284,000	2%	120,865	98,000	23%	Jul 07 estd
Totals			10,327,751	10,204,000	1%	£572,510	£463,000	24%	

4.B - Appendix B – Fossil Fuel Data

Gas Invoices			2006/7	2005/6	% change	2006/7	2005/6	% change
Main Campus			kWh	kWh	kWh	£	£	£
Central Heating Station	1000	###	26,407,559	29,424,276	-10%	£392,939	£683,274	-42%
Rutland Hall & Sherwood Hall	2191	###	2,836,231	3,193,447	-11%	£64,650	£90,772	-29%
Cripps Hall	2171	###	2,175,787	2,350,540	-7%	£34,104	£53,897	-37%
Hugh Stewart Hall	2181	###	2,099,392	2,489,463	-16%	£32,798	£57,733	-43%
Derby Hall	2121	###	1,782,678	2,077,816	-14%	£28,933	£48,563	-40%
Lenton & Wortley Hall	2141	###	1,522,367	1,649,854	-8%	£23,968	£37,736	-36%
Nightingale Hall	2161	###	1,513,115	1,580,473	-4%	£23,880	£37,199	-36%
Lincoln Hall	2151	###	1,446,353	1,624,931	-11%	£23,427	£38,178	-39%
Bio-Molecular Sciences Phase 1	1353	###	1,413,794	1,853,722	-24%	£22,835	£43,787	-48%
Willoughby Hall	2211	###	1,360,967	1,548,480	-12%	£21,745	£31,874	-32%
Swimming Pool	1571	###	1,090,421	1,158,326	-6%	£16,828	£25,218	-33%
Tower, MRI etc	1271	###	1,078,416	1,149,048	-6%	£17,600	£26,258	-33%
Cavendish Hall	2111	###	1,013,551	1,098,916	-8%	£16,429	£26,147	-37%
Florence Boot Hall	2131	###	992,943	1,169,694	-15%	£15,883	£27,597	-42%
Ancaster Hall	2101	###	945,751	991,639	-5%	£15,474	£22,721	-32%
Bio-Molecular Sciences Phase 2		###	939,220	0	#DIV/0!	£13,327	£0	#DIV/0!
Institute of Hearing Research	1401	###	882,602	989,560	-11%	£13,552	£21,511	-37%
Jesse Boot Conference Centre	1481	###	852,521	1,384,625	-38%	£12,652	£30,809	-59%
Boots Science Building	1581	###	837,792	958,352	-13%	£12,956	£21,965	-41%
Trent Building, Law & Social Sci etc	1101	###	574,344	555,850	3%	£9,543	£13,192	-28%
Sports Centre, Main Campus	1221	###	532,031	584,477	-9%	£8,730	£13,668	-36%
Staff Club Lenton Mount	1181	###	478,010	509,283	-6%	£7,399	£11,433	-35%
Arts Centre & School of Music	1501	###	462,640	447,240	3%	£7,413	£10,136	-27%
Architecture	1433	###	408,571	498,581	-18%	£7,130	£14,683	-51%
Wolfson Building	1421	###	399,565	359,319	11%	£6,479	£8,327	-22%
D.H.Lawrence Lakeside Pavilion	1631	###	321,743	420,318	-23%	£5,189	£10,092	-49%
Cripps Hall Kitchen	2171	###	305,495	313,360	-3%	£4,556	£6,592	-31%
Redcourt	2221	###	297,295	333,719	-11%	£4,852	£6,572	-26%
Innovative Technology Research Ce	1641	###	272,871	276,586	-1%	£5,395	£7,361	-27%
Cripps Health Centre	1231	###	240,858	284,649	-15%	£3,719	£6,468	-43%
Lenton Hurst	2411	###	231,199	324,246	-29%	£3,924	£7,463	-47%
Sherwood Hall Kitchen	2200	###	176,135	179,121	-2%	£2,749	£3,958	-31%
MMMEM (Production Engineering)	1371	###	167,657	209,559	-20%	£2,707	£4,907	-45%
Portland Building Extension	1111	###	165,951	219,350	-24%	£2,705	£5,041	-46%
Lenton Close Annexe (Cripps Hall)	2175	###	164,530	182,293	-10%	£2,694	£4,150	-35%
New Studio (Built Environment)	1439	###	152,679	228,542	-33%	£2,358	£4,364	-46%
Paton House (Built Env.)	1441	###	141,697	151,624	-7%	£2,217	£3,557	-38%
Lenton & Wortley Hall Kitchen	2141	###	141,380	126,590	12%	£2,055	£2,737	-25%
Sports Centre, Fitness Centre	1221	###	120,766	235,368	-49%	£2,327	£4,627	-50%
Lincoln Hall Kitchen	2151	###	119,388	151,775	-21%	£1,890	£3,405	-44%
Lenton Eaves (UNSSC) - Gas	1461	###	116,513	90,000	29%	£2,336	£1,800	30%
Cavendish Hall Extension	2115	###	104,044	107,982	-4%	£1,526	£2,300	-34%
Lenton Grove (History)	1211	###	103,334	170,309	-39%	£1,923	£3,998	-52%
Rutland Hall Extension	2195	###	98,776	100,345	-2%	£1,453	£2,172	-33%
Cavendish Hall Kitchen	2111	###	97,237	122,184	-20%	£1,470	£2,622	-44%
Rutland Hall Kitchen	2191	###	90,516	97,179	-7%	£1,412	£2,081	-32%
Playgroup	1411	###	87,223	87,769	-1%	£1,415	£2,041	-31%
Sustainable Research Building	1436	###	80,028	185,569	-57%	£1,278	£4,016	-68%
China House (Lenton Fields)	2163	###	75,000	97,000	-23%	£550	£981	-44%
Portland Building Bar	1111	###	59,322	68,286	-13%	£859	£1,398	-39%
Former Warden's House, Cavendis	2113	###	56,696	54,647	4%	£865	£1,233	-30%
J.Boot C.C. Annexe (Cottage)	1482	###	55,804	60,408	-8%	£904	£1,384	-35%
Orchards	1161	###	55,197	68,749	-20%	£941	£1,650	-43%
Warden's House Sherwood Hall	2207	###	53,067	53,476	-1%	£790	£1,227	-36%
Lenton Lodge	2251	###	47,587	47,979	-1%	£769	£1,145	-33%
Warden's House Rutland Hall	2194	###	34,488	42,836	-19%	£590	£1,032	-43%
Warden's House Ancaster Hall	2105	###	31,380	38,529	-19%	£511	£874	-42%
Paton Cottage	###	###	29,872	28,614	4%	£451	£658	-31%
1 Nightingale Close (Nigh.Hall Warc	2321	###	29,863	36,841	-19%	£478	£831	-42%
Warden's House Florence Boot Hall	2133	###	29,456	34,483	-15%	£461	£766	-40%
Lenton Firs Lodge West	2241	###	27,310	35,911	-24%	£460	£837	-45%
5A Wortley Hall Close (Eco-House)	2296	###	15,878	19,856	-20%	£238	£457	-48%
Sherwood Hall Laundry	2200	###	7,686	7,777	-1%	£112	£153	-27%
New Eco-houses		###	0	0	#DIV/0!	£113	£0	#DIV/0!
Energy Learning Unit (old Squash C	1223	###	-4,423	42,566	-110%	£-284	£1,003	-128%
Total of 65 accounts	Totals		58,448,119	64,984,307	-10%	921,632	1,514,631	-39%

4.B - Appendix B – Fossil Fuel Data continued

Gas Invoices		2006/7	2005/6	% change	2006/7	2005/6	% change
Sutton Bonington		kWh	kWh	kWh	£	£	£
Main Boilerhouse	6800 ##	8,256,292	9,214,579	-10%	£129,570	£208,663	-38%
Plant Sciences	5711 ##	2,361,977	2,444,601	-3%	£37,677	£58,949	-36%
Animal Houses Boilerhouse	6800 ##	2,250,242	2,588,200	-13%	£35,286	£56,881	-38%
Veterinary School	5721 ##	1,416,859	0	#DIV/0!	£21,350	£0	#DIV/0!
Portakabins (T.C.R. unit)	5301 ##	258,440	57,993	346%	£4,220	£829	409%
The Elms (Environmental Science)	5161 ##	152,494	185,342	-18%	£2,410	£4,418	-45%
Sports Pavilion Sutton Bonington	5621 ##	111,658	93,710	19%	£1,677	£2,212	-24%
Main Building (Sutton Bonington)	5011 ##	96,733	93,484	3%	£1,519	£2,173	-30%
Sports Hall Sutton Bonington	5221 ##	67,847	84,964	-20%	£1,074	£2,050	-48%
Food Sciences Building	5701 ##	61,028	59,791	2%	£876	£1,227	-29%
Food Hall	5081 ##	59,067	47,563	24%	£892	£1,071	-17%
St.Michael's Flats Nos 6&7	6842 ##	58,700	50,422	16%	£1,069	£1,207	-11%
Hathern House, Bon. Hall (4)	5831 ##	57,701	95,295	-39%	£894	£2,094	-57%
Bonington Hall Laundry & Gym	5881 ##	39,002	54,114	-28%	£565	£1,192	-53%
St.Michael's Flats Nos 8&9	6843 ##	37,675	32,771	15%	£509	£470	8%
Bonington Hall Warden's House	5842 ##	33,840	38,893	-13%	£569	£903	-37%
St.Michael's House Flat 1	6841 ##	33,371	24,477	36%	£554	£561	-1%
St.Michael's House Flat 5	6841 ##	29,691	17,016	74%	£495	£414	20%
St.Michael's House Flat 2	6841 ##	23,456	13,500	74%	£389	£318	22%
24 College Road	6805 ##	16,824	20,552	-18%	£300	£490	-39%
St.Michael's House Flat 3	6841 ##	14,959	9,663	55%	£249	£233	7%
52 College Road	6820 ##	14,057	19,591	-28%	£241	£456	-47%
St.Michael's House Flat 4	6841 ##	12,049	21,763	-45%	£186	£501	-63%
North Laboratory	5091 ##	790	947	-17%	£12	£21	-43%
Eviton House (68 College Road)	5891 ##	-1,436	74,117	-102%	£-227	£1,726	-113%
Total of 25 accounts	Totals	15,463,316	15,343,348	1%	242,356	349,059	-31%
Gas Invoices		2006/7	2005/6	% change	2006/7	2005/6	% change
Jubilee Campus		kWh	kWh	kWh	£	£	£
Newark Hall	7130 ##	1,133,403	1,334,531	-15%	£18,998	£30,390	-37%
Southwell Hall	7120 ##	585,392	703,900	-17%	£9,518	£16,092	-41%
Melton Hall	7110 ##	578,668	542,810	7%	£8,896	£12,299	-28%
Computer Sciences (DCS) & The A	7040 ##	517,679	625,451	-17%	£8,536	£14,746	-42%
New Business School	7080 ##	414,285	294,807	41%	£6,741	£7,021	-4%
The Exchange (CTF)	7030 ##	337,197	456,864	-26%	£5,985	£10,939	-45%
Dearing Building (FOE)	7050 ##	319,198	389,591	-18%	£5,575	£9,190	-39%
Jubilee Sports Centre	7301 ##	282,458	70,000	304%	£6,177	£1,750	253%
Business School North (SMF)	7020 ##	188,938	264,721	-29%	£3,537	£6,349	-44%
Atrium Catering HWS	7040 ##	148,986	344,324	-57%	£2,223	£8,116	-73%
Total of 10 items		4,506,204	5,026,999	-10%	76,186	116,892	-35%
Gas Invoices		2006/7	2005/6	% change	2006/7	2005/6	% change
Others		kWh	kWh	kWh	£	£	£
King's Meadow Campus	6901 ##	2,788,266	2,825,631	-1%	£44,557	£64,224	-31%
Clinical Sciences (City Hospital)	3325 #01	1,312,419	1,517,401	-14%	£28,000	£35,000	-20%
Derby Medical School	3561 ##	737,064	929,196	-21%	£11,851	£22,415	-47%
Grove Farm - OIL	6122 ##	294,728	225,884	30%	£9,999	£7,945	26%
14-22 Shakespeare Street	6101 ##	197,401	239,154	-17%	£3,237	£5,782	-44%
Sports Ground - Highfields new sup	6311 ##	179,021	84,196	113%	£2,896	£1,412	105%
Clumber Lodge	6900 ##	175,252	356,864	-51%	£3,101	£6,700	-54%
8 Peachey Street	6102 ##	64,081	90,655	-29%	£1,076	£2,174	-51%
Unit 5, William Lee Buildings	6885 ##	50,456	65,697	-23%	£784	£1,467	-47%
Sports Ground - Highfields - tea roo	6311 ##	30,304	30,034	1%	£496	£745	-33%
Unit 6, William Lee Buildings	6883 ##	29,016	45,081	-36%	£441	£668	-34%
Boathouse - OIL	6321 ##	22,099	0	#DIV/0!	£634	£0	#DIV/0!
Sports Ground - Highfields - mess r	6311 ##	0	0	#DIV/0!	£0	£0	#DIV/0!
Total of 13 accounts		5,880,107	6,409,793	-8%	107,072	148,532	-28%
Steam Used		2006/7	2005/6	% change	2006/7	2005/6	% change
Medical School		kWh	kWh	kWh	£	£	£
Medical School	(std)	20,848,006	21,418,475	-3%	£341,903	£685,857	-50%
Embedded Units (Q.M.C.)	(std)	4,562,317	4,893,437	-7%	£75,143	£163,175	-54%
Total		25,410,323	26,311,912	-3%	£417,046	£849,032	-51%

4.C - Appendix C – Water Data

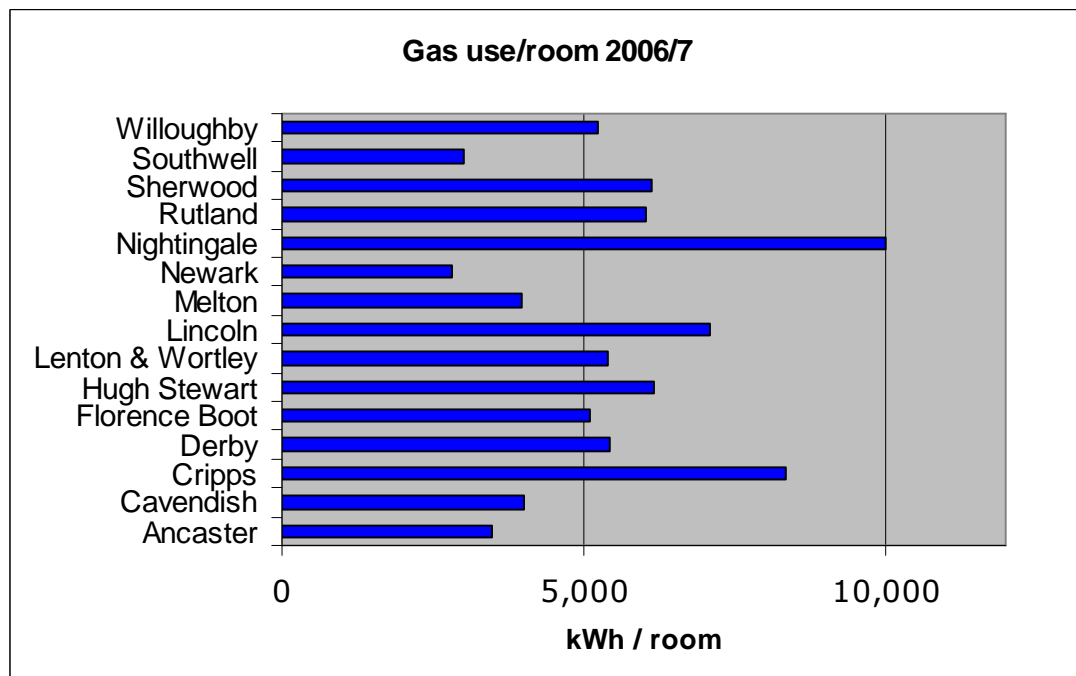
Water Invoices		2006/7	2005/6	% change	2006/7	2005/6	% change
Main Campus		cubic m.	cubic m.	cubic m.	£	£	£
Main Supply, Sth. Entrance	1000 ##	436,899	512,491	-15%	0	0	#DIV/0!
Nightingale Hall	2161 ##	11,590	10,540	10%	0	0	#DIV/0!
Science Area	1000 ##	9,699	8,316	17%	0	0	#DIV/0!
Jesse Boot Conference Centre	1481 ##	7,049	6,862	3%	0	0	#DIV/0!
Jesse Boot Conference Centre	1481 ##	3,874	3,257	19%	0	0	#DIV/0!
Lenton Hurst	2411 ##	1,148	1,070	7%	0	0	#DIV/0!
Lenton Eaves (UNSSC)	1461 ##	791	905	-13%	0	0	#DIV/0!
Lenton Lodge	2251 ##	565	314	80%	0	0	#DIV/0!
Paton House (Built Env.)	1441 ##	405	421	-4%	0	0	#DIV/0!
Redcourt	2221 ##	404	437	-8%	0	0	#DIV/0!
Architecture	1433 ##	371	726	-49%	0	0	#DIV/0!
Beeston Lane Gardeners' Compour	1511 ##	334	360	-7%	0	0	#DIV/0!
Lenton Grove (History)	1211 ##	285	506	-44%	0	0	#DIV/0!
Playgroup	1411 ##	254	239	6%	0	0	#DIV/0!
5A Wortley Hall Close (Eco-House)	2296 ##	86	53	62%	0	0	#DIV/0!
Water and SWD	1000 ##	0	0	#DIV/0!	354,000	364,652	-3%
TE and Sewerage	1000 ##	0	0	#DIV/0!	290,000	302,892	-4%
Total of 17 accounts	Totals	473,754	546,497	-13%	644,000	667,544	-4%
Water Invoices		2006/7	2005/6	% change	2006/7	2005/6	% change
Sutton Bonington		cubic m.	cubic m.	cubic m.	£	£	£
Landcroft Lane meter	6800 ##	90255	145500	-	0	0	#DIV/0!
College Road meter	6800 ##	10214	14000	-	0	0	#DIV/0!
St.Michael's Close	6841 ##	2,032	1,997	2%	3,782	3,445	10%
Bunny Park Farm	6860 ##	369	555	-34%	428	589	-27%
Trough, Kegworth	6910 ##	0	0	#DIV/0!	18	18	0%
S.B. Campus Water Costs	6800 ##	0	0	#DIV/0!	71400	105850	-
S.B. Campus Trade Effluent	6800 ##	0	0	#DIV/0!	78100	77000	0
Total of 7 items		102,870	162,052	-37%	153,728	186,902	-18%
Water Invoices		2006/7	2005/6	% change	2006/7	2005/6	% change
New Campus		cubic m.	cubic m.	cubic m.	£	£	£
Jubilee Campus	7000 ##	52,712	52,098	1%	105,000	66,000	59%
Newark Hall	7130 ##	14,627	14,658	0%	29,505	27,010	9%
Southwell Hall	7120 ##	7,631	9,333	-18%	16,989	18,811	-10%
Triumph House	6701 ##	432	416	4%	1,039	912	14%
Jubilee Sports Centre	7301 ##	386	386	-	3,710	3,419	9%
Charnock Ave Sports Pavilion	7201 ##	30	29	3%	85	72	18%
Triumph House	6701 ##	0	0	#DIV/0!	215	198	9%
Total of 7 items		75,818	76,920	-1%	156,543	116,422	34%
Water Invoices		2006/7	2005/6	% change	2006/7	2005/6	% change
Others		cubic m.	cubic m.	cubic m.	£	£	£
King's Meadow Campus	6901 ##	6,099	5,814	5%	30,232	27,324	11%
Clinical Sciences (City Hospital)	3325 ##	11,000	13,262	-17%	15,000	17,000	-12%
Grove Farm - Changing Rooms	6122 ##	1,088	961	13%	1,205	1,070	13%
Sports Ground - Highfields	6311 ##	971	1,280	-24%	1,780	2,217	-20%
Boat House	6321 ##	709	185	283%	1,284	321	3
14-22 Shakespeare Street	6101 ##	613	559	10%	1,163	983	18%
Clumber Lodge	6900 ##	158	629	-75%	188	648	-71%
Unit 5, William Lee Buildings	6885 ##	113	116	-3%	579	508	0
8 Peachey Street	6102 ##	97	107	-9%	295	293	1%
Unit 6, William Lee Buildings	6883 ##	55	48	15%	800	668	20%
Unit 8, Edison Village (Synergy Hou	6891 ##	37	26	42%	185	142	0
Unit 8, William Lee Buildings	6884 ##	0	0	#DIV/0!	86	51	69%
Total of 12 accounts		20,940	22,987	-9%	52,797	51,225	3%
Water Recharges		2006/7	2005/6	% change	2006/7	2005/6	% change
Medical School		cubic m.	cubic m.	cubic m.	£	£	£
Medical School		32,828	32,318	2%	52,512	53,000	-1% Est
Embedded Units (Q.M.C.)		10,800	10,800	0%	13,000	13,200	-2% Est
		43,628	43,118	1%	65,512	66,200	-1%

4.D - Appendix D – Halls of Residence

4.D. Gas Consumption in Halls of residence

	No. of Rooms	2005/6 Gas kWh	2006/7 Gas kWh	2005/6 Gas kWh/room	2006/7 Gas kWh/room
Ancaster	272	991,639	945,751	3,646	3,477
Cavendish	279	1,206,898	1,117,595	4,326	4,006
Cripps	317	2,846,193	2,645,812	8,979	8,346
Derby	327	2,077,816	1,782,678	6,354	5,452
Florence Boot	194	1,169,694	992,943	6,029	5,118
Hugh Stewart	341	2,489,463	2,099,392	7,300	6,157
Lenton & Wortley	307	1,776,444	1,663,747	5,786	5,419
Lincoln	221	1,776,706	1,565,741	8,039	7,085
Melton	146	542,810	578,668	3,718	3,963
Newark	400	1,334,531	1,133,403	3,336	2,834
Nightingale	151	1,580,473	1,513,115	10,467	10,021
Rutland	267	1,794,248	1,607,408	6,720	6,020
Sherwood	261	1,783,622	1,601,937	6,834	6,138
Southwell	193	703,900	585,392	3,647	3,033
Willoughby	260	1,548,480	1,360,967	5,956	5,234
Totals	3936	23,622,916	21,194,548	6,002	5,385

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



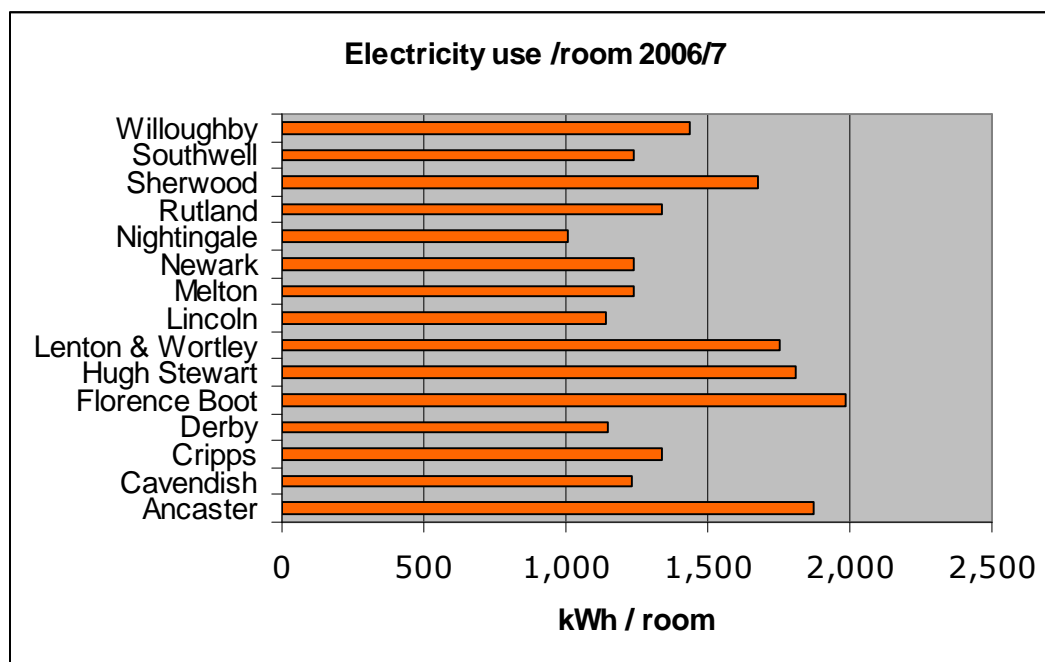
Graph 4.D.2 Graph showing 2006/7 gas consumption per room in halls

4.D - Appendix D – Halls of Residence continued

4.D. Electricity Consumption in Halls of residence

	No. of Rooms	2005/6 Elec kWh	2006/7 Elec kWh	2005/6 Elec kWh/room	2006/7 Elec kWh/room
Ancaster	272	531,326	509,687	1,953	1,874
Cavendish	279	362,649	343,410	1,300	1,231
Cripps	317	359,482	425,087	1,134	1,341
Derby	327	355,252	374,429	1,086	1,145
Florence Boot	194	382,477	385,714	1,972	1,988
Hugh Stewart	341	625,363	617,960	1,834	1,812
Lenton & Wortley	307	529,142	537,466	1,724	1,751
Lincoln	221	258,720	252,489	1,171	1,142
Melton	146	191,159	181,119	1,309	1,241
Newark	400	523,723	496,217	1,309	1,241
Nightingale	151	347,230	151,705	2,300	1,005
Rutland	267	425,847	357,439	1,595	1,339
Sherwood	261	442,237	437,327	1,694	1,676
Southwell	193	252,697	239,425	1,309	1,241
Willoughby	260	373,715	373,629	1,437	1,437
	3936	5,961,019	5,683,103	1,514	1,444

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



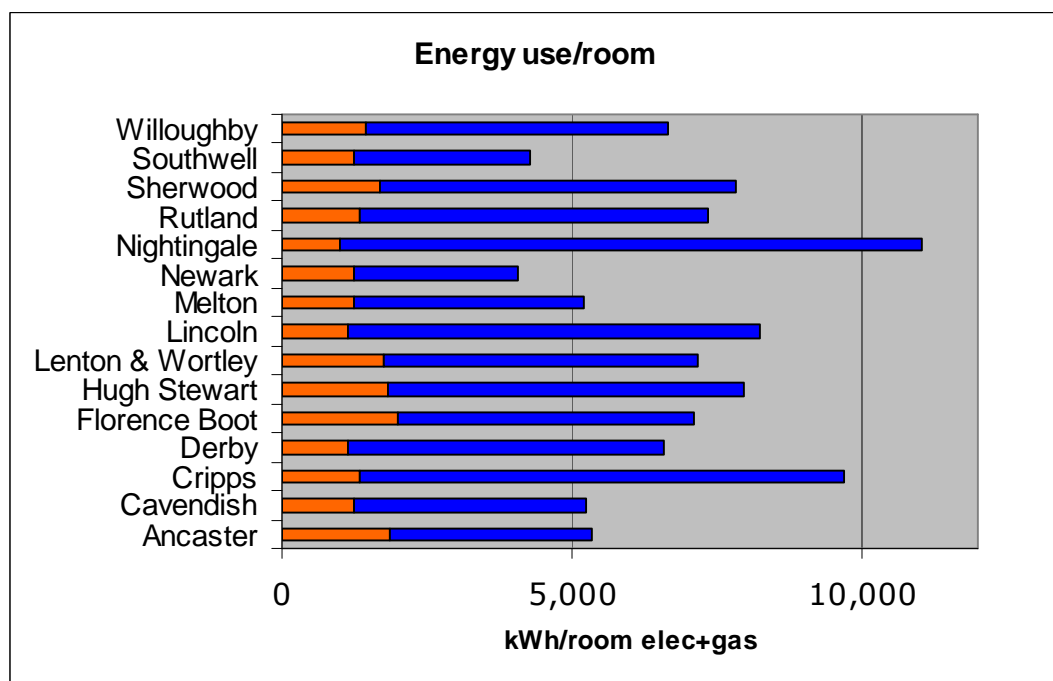
Graph 4.D.4 Graph showing 2006/7 electricity consumption per room in halls

4.D - Appendix D – Halls of Residence continued

4.D. Energy Consumption in Halls of residence

	No. of Rooms	2006/7 Elec kWh	2006/7 Gas kWh	2006/7 Elec kWh/room	2006/7 Gas kWh/room
Ancaster	272	509,687	945,751	1,874	3,477
Cavendish	279	343,410	1,117,595	1,231	4,006
Cripps	317	425,087	2,645,812	1,341	8,346
Derby	327	374,429	1,782,678	1,145	5,452
Florence Boot	194	385,714	992,943	1,988	5,118
Hugh Stewart	341	617,960	2,099,392	1,812	6,157
Lenton & Wortley	307	537,466	1,663,747	1,751	5,419
Lincoln	221	252,489	1,565,741	1,142	7,085
Melton	146	181,119	578,668	1,241	3,963
Newark	400	496,217	1,133,403	1,241	2,834
Nightingale	151	151,705	1,513,115	1,005	10,021
Rutland	267	357,439	1,607,408	1,339	6,020
Sherwood	261	437,327	1,601,937	1,676	6,138
Southwell	193	239,425	585,392	1,241	3,033
Willoughby	260	373,629	1,360,967	1,437	5,234
Totals	3936	5,683,103	21,194,548	1,444	5,385

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



Graph 4.D.4 Graph showing 2006/7 energy consumption per room in halls

4.E – Appendix E – Major areas of work during 2006/7

- Installation of BMS heating controls at Nottingham Medical School, including weather compensation, optimum start, and control of the variable temperature heating pumps.
- Report into scope for decentralising the main district heating scheme at University Park. This showed efficiencies from following an incremental move to decentralisation, and was adopted as policy.
- Two phases of installing electricity sub-metering at University Park, Sutton Bonington, and Nottingham Medical School (176 meters). The meters are linked to an *Elcomponent Meter-Ring* computer system, that allows data to be displayed real time and recorded every half-hour.
- Installation of BMS heating controls at Redcourt.
- Fitting of inverters to the Swimming Pool circulation pumps.
- Installation of BMS heating controls at King's Meadow Campus, including weather compensation of the heating boilers, optimum start, and control of the four main pumped heating circuits.
- Temperature control via the BMS of the Constant temperature heating circuit and pumps at Nottingham Medical School.
- Investigations and trials, in association with IS, into reducing electrical use in computer suites when PCs are not in use.
- Inverters fitted on fresh air dampers at main boilers at University Park
- Review of F floor ventilation requirements, Nottingham, Medical School. This has highlighted opportunities for economies that will be funded in 07/08.
- Report investigating the scope for use of micro-CHP in University buildings. This indicated that payback periods are currently significantly longer than for other schemes.