

April 2007/08

Good practice

Annual report

This report is for information

This publication reports on the progress and findings of estate management statistics (EMS) during 2006. EMS shares estates information among UK higher education institutions and empowers institutions to improve management of the physical infrastructure. The report highlights five different aspects of estates performance and comments on those of most concern.

April 2007/08

Performance in higher education estates

EMS annual report 2006

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Performance in higher education estates

EMS annual report 2006

To	Heads of HEFCE-funded higher education institutions Heads of SFC-funded higher education institutions Heads of HEFCW-funded higher education institutions Heads of universities in Northern Ireland
Of interest to those responsible for	Strategic planning, Finance, Estates
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Executive summary

Purpose

1. This publication reports on the progress and findings of the Estate Management Statistics (EMS) service during 2005-06 for the 2004-05 financial year. The 2006 data incorporated returns from 159 out of the 161 UK higher education institutions (HEIs). Most of the trend analysis in this report relates to the two years from 2002-03 to 2004-05. We recommend that senior management teams and estates committees consider this report and use EMS to develop their strategic and operational planning.

Key points

Making the estate more affordable

2. Property costs went up more slowly than income, with property efficiency outcomes worth about £45 million per year. The ratio of property cost to income is improving: the median ratio decreased by 0.25 per cent over the two years from 2002-03 to 2004-05. This achievement is linked to a 2.5 per cent median improvement in space per student. Where the cost to income ratio deteriorated, this was generally associated either

with higher spending to repair and improve the estate or with increases in space per student.

3. Median income per m² rose by 13 per cent over the two years, reflecting increased productivity of space as income rose substantially faster than space.

Cost control

4. Inflation, higher service levels, spending on repair, more expensive energy and the costs associated with more intensive use of space have all contributed to an 11 per cent increase in costs per m² over the two years 2002-04. Nevertheless, a quarter of HEIs saw a reduction in costs.

Encouragingly, the cost per student has gone up by a slightly lower figure, 9 per cent, as better space management has taken effect. Moreover, increased expenditure is often justified to deliver higher service levels and better quality space in order to meet business needs.

Space management

5. As overall student numbers rose faster than space, typical figures for overall space per student went down by 3 per cent between 2002-03 and 2004-05, with reductions achieved in nearly 60 per cent of HEIs, particularly in teaching space. Support space and office provision for academic and support staff hardly changed, with significant variations – and potential efficiency improvements – still evident between institutions.

Environmental sustainability

6. The sector has recorded significant environmental achievements but there is still a great deal further to go to improve performance to acceptable levels. Analysis of teaching-intensive HEIs reveals that there is still a high variation (60 per cent) between the upper and lower quartiles for consumption of energy, CO₂ and water. The reasons for this variation need further exploration.

Condition and repair

7. The proportion of the estate in good condition for a typical university has grown by nearly 3 per cent over the two years. This is quite a large increase and it looks set to continue, with a 90 per cent increase in capital investment recorded over the same period. Nevertheless, the condition of the

estate is still one of the most important challenges facing the sector, as 30 per cent of the total stock remains in an unsatisfactory condition.

8. ‘Backlog affordability’ is a simple ratio of HEI income divided by the funding required to bring the estate into good condition and compliance with legislation. The typical HEI has six times more income than backlog costs (that is, a ratio of six). However, 34 per cent of HEIs have a ratio of four or less, which represents a high level of risk for these institutions.

9. Most HEIs are improving the majority of their key ratios. The most significant areas of improvement over the two years have been:

- teaching and research income per m²
- backlog maintenance cost and affordability
- income per bed space for residential property.

10. Further performance improvements are still achievable at many institutions. The main priorities would appear to be:

- a higher quality estate in better condition
- significant space efficiencies, particularly in support space and offices
- a continuing drive to improve environmental performance.

11. The adoption of a limited number of key targets in well-drafted estates strategies will help HEIs to focus and make progress in a way that will often make a difference to their organisations.

12. A glossary of key terms and abbreviations used in the report is in Annex B.

Introduction

13. This report was produced by IPD Occupiers and has been endorsed by the Estate Management Statistics (EMS) Steering Group.

14. The 161 UK higher education institutions (HEIs) included in EMS manage 25.2 million m² of gross space with a total annual estimated property revenue cost of £1,672 million. Data were received from 159 institutions during 2006, representing 99 per cent of the sector.

15. This publication reports on the progress and findings of the EMS service for the 2004-05 financial year. Most of the trend analysis relates to the two years from 2002-03 to 2004-05.

16. EMS results can be downloaded by HEIs from the EMS web-site; all institutions have access to both data and performance measures for all HEIs. This allows each institution to understand its strengths and weaknesses in context and to set targets.

17. Neither the EMS service team nor the funding councils seek to be prescriptive about how the data are used; institutions are encouraged to use them to suit their own needs.

18. In addition to covering the main differences between UK countries and some peer groups of institutions, this annual report covers five specific topics:

- making the estate more affordable
- cost control

- space management
- environmental sustainability
- condition and repair.

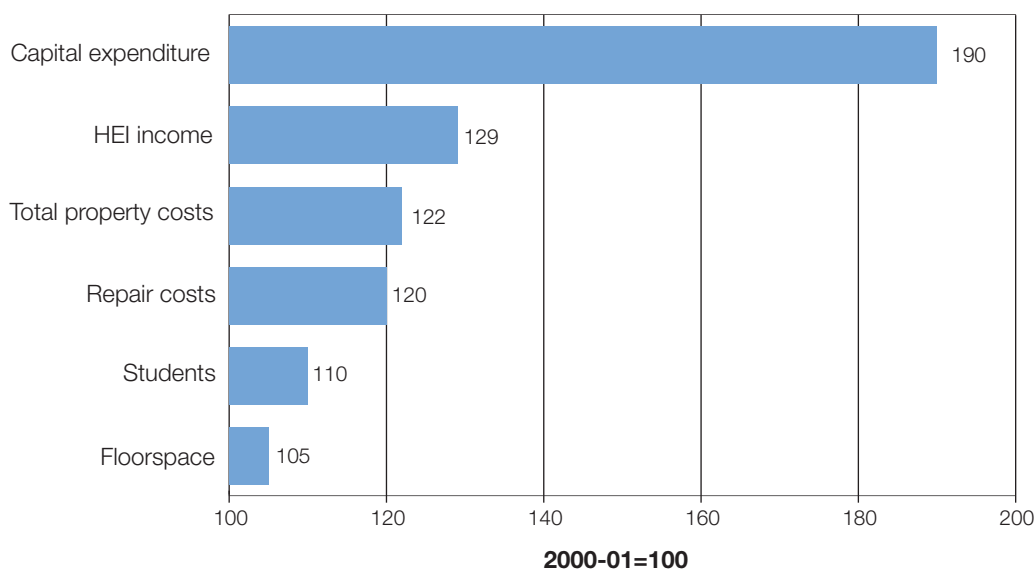
19. HEFCE 99/18 details much of the early development work on the EMS project. Since then, annual reports have described progress to date. These are available from the EMS web-site, www.opdems.ac.uk, which also provides background on the service and technical information.

The size of the sector

20. The figures in Table 11 of Annex A provide an overview of the UK higher education estate. The numbers emphasise the huge size of the sector, equivalent to some 20 per cent of the whole UK office market. The overall estate is about 25 million m² of gross space with annual revenue costs of £1.67 billion, a third of which goes on repair and maintenance. A further £1.9 billion is spent on capital improvements of buildings. The backlog maintenance liability is about £4.3 billion and the annual CO₂ emissions weigh an estimated 2.0 million tonnes.

21. Figure 1 shows some of the key estates totals indexed from 2000-01 to 2004-05; all these totals have moved up progressively over this period. The figures show a sector in growth, with the biggest change in the 90 per cent increase in capital expenditure, against a backdrop of income and full-time equivalent (FTE) student numbers increasing by about 30 per cent and 10 per cent respectively.

Figure 1 **Index of estates totals, 2000-01 to 2004-05 (2000-01 = 100)**



Trend analysis 2002-03 to 2004-05

22. We have calculated a subjective rating of performance based on the distribution of change across all HEIs (see Table 13 in Annex A), using the difference between the percentages of HEIs showing significant improvement against those with significant ‘deteriorating’ performance. These are summarised in Figure 2.

23. The results are encouraging and show the following trends:

- income trends show a more affordable estate (property cost to income ratio is falling) and higher income per m²
- overall reduction in space per student, although office allocations have increased
- energy consumption per student has shown no improvement over the period. However, a significant number of HEIs are moving to renewable energy, as evidenced by 18 per cent decreases in energy emissions
- water consumption is being reduced significantly in many HEIs
- the rate of improvement in the condition of estates is increasing and the outstanding cost to upgrade is falling
- dealing with the repair backlog is becoming more affordable for HEIs, especially for the non-residential estate.

24. However, there are still clear areas for improvement in some institutions:

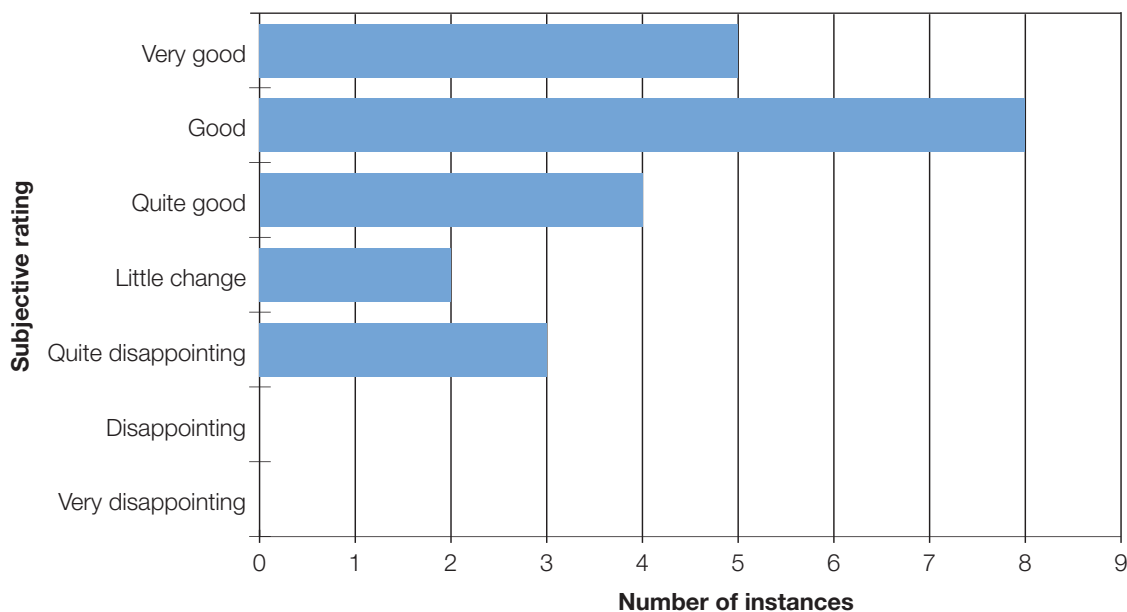
- the condition of the estate
- cost to income ratio or income per m²
- space efficiency overall and for particular types of space such as offices
- environmental performance.

How do UK countries and peer groups of HEIs compare?

25. Table 14 in Annex A shows the median results for a number of indicators, for all UK HEIs. It also gives the percentage differences from the median for Scotland and Wales and for the following peer groups of HEIs, which can easily be customised and produced within the EMS institution report:

- Institutions with research income more than 20 per cent of total income, representing many of the larger and more traditional HEIs.
- Institutions with research income less than 10 per cent of total income, representing many of the newer and more teaching-focused HEIs.
- Institutions with total income of less than £30 million, representing many of the smaller and more specialised HEIs.

Figure 2 **Subjective ratings of change in 22 key indicators, from 2002-03 to 2004-05**



26. The findings are summarised in Table 1 below.

Table 1 Comparison of Scotland and Wales and groups of HEIs with median results for all UK HEIs (see Annex A Table 14)

Country/peer group	Comments
Scotland	<ul style="list-style-type: none"> • Very high property costs per student as result of greater space provision per student • Somewhat lower property costs per m² • Significantly poorer condition of estate with large repair backlog • Lower level of capital investment • Lower utilisation of teaching space • Much higher energy costs (reflecting location), although unit price of procurement is lower • Higher water consumption • The reasons for many of these differences require further investigation
Wales	<ul style="list-style-type: none"> • Lower income per m² but more than compensated for by lower property costs • Slightly more overall space per student, significantly more for teaching space • Slightly better condition than for UK median, with lower cost to upgrade relative to income • Better recycling of waste and lower CO₂ emissions per m²
Research income more than 20 per cent	<ul style="list-style-type: none"> • Significantly higher property costs per student apparently caused by more space per student. This could be caused by the need for more space per student for research activities • Building condition slightly worse than the median, but the cost to upgrade as a percentage of income is significantly higher • Significantly more office space per student • Energy consumption is almost double that of the median result for all UK HEIs, presumably as a result of research activities. Water consumption is also more than double the median
Research income less than 10 per cent	<ul style="list-style-type: none"> • Lower property costs per student with correspondingly less space • Less office space per student • Lower energy and water consumption
Income less than £30 million	<ul style="list-style-type: none"> • Income per m² is lower • Teaching space per student is significantly higher as a result of many of these HEIs being in specialist areas such as arts and drama • Despite this, overall space per student is only 6 per cent higher than the median, reflecting less support space • Utilisation rate is very high • The cost to upgrade is relatively low compared with income • Energy and water consumption are lower than the median for all UK HEIs, but use of recycling is less advanced

Making the estate more affordable

27. The EMS report has always emphasised the importance of ensuring that the estate is meeting the overall business needs of the HEI. Among other things, the average institution is particularly concerned with ensuring that its space is ‘affordable’ – and getting more so: in other words, that its ratio of total property costs to total income is declining. Income per m² is another important business-related ratio examined below.

28. The ratio of property cost to income is improving in most HEIs:

- a. The median ratio of property cost to income is now 9.5 per cent, and the average ratio reduced by about 0.25 per cent in the two years from 2002-03 to 2004-05. This reduction is worth about £45 million per year to the sector.
- b. A quarter of HEIs reduced their ratios of property cost to income by 10 per cent (equivalent to a full 1 per cent in the ratio itself) showing that they are managing the relationship between property costs and income successfully.

c. Some institutions did see increases in their cost to income ratios. There appear to be two reasons for these increases:

- increased expenditure in the short term to deal with buildings in poor condition
- less than average growth in student numbers.

d. Residential finances also improved slightly. The median for all UK HEIs for residential property cost to income ratio fell by 2 per cent, and HEIs in the best performing quartile brought their ratios down by nearly 9 per cent.

29. Table 2 compares those HEIs where the property cost to income ratio has increased with those where the ratio declined, showing changes for chosen indicators over the two year period under examination. The differences are interesting, although these do not necessarily establish a causal relationship.

30. Income per m² has risen across the board:

- a. Changes in the income per m² can be used to track space ‘productivity’, and distinctions can be drawn between teaching and research space.
- b. Median income per m² rose by 14 per cent, reflecting increased productivity of space as income rose substantially faster than space provision.

Table 2 **Changes in results for chosen indicators between 2002-03 and 2004-05**

Key ratio	HEIs with increases in ratio of total property costs to income	HEIs with reductions in ratio of total property costs to income	Difference
Maintenance costs and capital expenditure per m ²	+99%	+60%	39%
Total property costs per student FTE	+24%	+2%	22%
Total property costs per m ²	+21%	+8%	13%
Energy consumption kWh per student FTE	+2%	-4%	6%
Total non-residential space per student FTE	+2%	-2%	4%
Support space per student FTE	+6%	+2%	4%
Percentage floor space in good condition	+6%	+3%	3%

- c. The increase was strong for teaching: a quarter of HEIs saw teaching income per m² of teaching space rise by 27 per cent and the median increase was 17 per cent. Very few HEIs saw reductions of teaching income per m².
- d. Results for research income were much more mixed: although ratios overall were up, the lower quartile change was a reduction of 11 per cent. This may reflect different fortunes in securing research income, with space allocations yet to be adjusted accordingly.
- e. Median research income per m² is still over £200 below that for teaching. (These numbers cannot be compared directly with overall HEI income per m² because of the effect of other space that does not produce income.)
- f. Residential income per bed space rose strongly by a median 10 per cent, with income now at £2,650.

Table 3 **Income-related indicators 2004-05**

Indicator	Lower quartile	Median	Upper quartile
Ratio of insurance replacement value to income 2004-05	1.85%	2.36%	3.01%
Percentage change 2002-03 to 2004-05	-11.5%	-0.9%	14.0%
Ratio of total property costs to HEI income 2004-05	8.3%	9.5%	11.1%
Percentage change 2002-03 to 2004-05	-10.0%	-2.5%	4.5%
Ratio of residential total property costs to residential income 2004-05	7.4%	8.5%	10.2%
Percentage change 2002-03 to 2004-05	-8.7%	-1.8%	5.5%
HEI income per m ² net internal area (NIA) of non-residential space 2004-05	£719	£858	£1,130
Percentage change 2002-03 to 2004-05	6.2%	13.5%	20.7%
Teaching income per m ² NIA of teaching space 2004-05	£1,401	£1,704	£2,095
Percentage change 2002-03 to 2004-05	7.2%	16.8%	26.5%
Research income per m ² NIA of research space 2004-05	£1,123	£1,495	£2,348
Percentage change 2002-03 to 2004-05	-11.0%	5.5%	26.4%
HEI income per bed space 2004-05	£2,152	£2,650	£3,090
Percentage change 2002-03 to 2004-05	2.4%	10.2%	16.4%

31. Figure 3 shows the variability of results for the income indicators:

- There are significantly different levels of income per m² across the sector. Those in the lower quartile may wish to consider ways of increasing their income or reducing their space provision.
- As would be expected, the variability of research income per m² is high, with the quartiles ranging from £1,123 to £2,348.
- Perhaps the most concerning variability is total property cost (TPC) to income, with the lower and upper quartiles varying from 8 per cent to 11 per cent. HEIs will rightly argue that their businesses are different but the extent of

variation in the underlying affordability of the estate is significant.

32. Some 35 per cent of institutions have income above £1,000 per m². Table 4 shows how some key ratios vary for HEIs above and below this level:

- Space per student is lower on average in institutions with a high income per m², but they seem able to afford better quality space: the percentage of space in good condition is 10 per cent higher. The repair backlog is also much less significant.
- In institutions with a high income per m², more money is spent on property per m² but less per student. This seems again to reflect improved space efficiency.

Figure 3 **Variability of income indicators 2004-05**

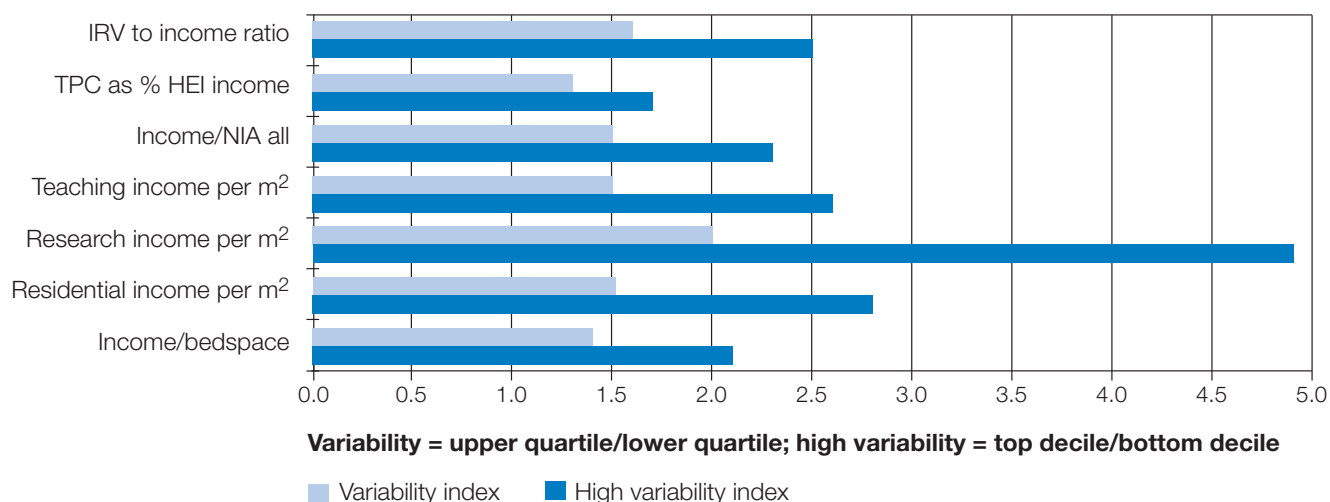


Table 4 **Comparison of key indicators for different levels of income**

	Income > £1,000 per m ²	Income < £1,000 per m ²	Difference
Percentage of HEIs in category	35%	65%	
HEI income per m ² NIA	£1,235	£759	£476
Total property costs per student FTE	£817	£920	-£102
Total property costs per m ² NIA	£108	£78	£30
Total non-residential NIA per student FTE	7.68 m ²	8.11 m ²	-0.43 m ²
Percentage gross internal area (GIA) in good condition (non-residential)	75%	65%	10%
Repair backlog as percentage of insurance replacement value (IRV) (non-residential)	6%	9%	-3%
Utilisation rate – teaching space	31%	24%	8%

Cost control

33. Costs have risen, but in the context of greater affordability:

- a. Inflation, higher service levels, spending on repair and capital improvement as well as on improved space efficiency have combined to cause an 11 per cent increase in property costs per m² over the two years 2002-03 to 2004-05. Nevertheless, almost a quarter of HEIs saw a reduction in costs per m².
- b. Encouragingly, the property cost per student has gone up by less, as better space management has taken effect. Moreover, increased expenditure is often justified to deliver higher service levels or better quality to meet business needs and recruit students.
- c. By nature, adding capital expenditure to total property costs widens the range of results.

Capital expenditure went up sharply, reflecting the commitment to improve the quality and condition of the estate.

- d. Property costs per bed space went down in some HEIs but the median change was an 11 per cent increase. The upper quartile result was an increase of 24 per cent.
34. Some costs rose substantially over the two years:
- a. Table 6 shows how typical percentage changes in costs per m² from 2002-03 to 2004-05 compare with the variability of the 2004-05 results, as measured by the inter-quartile variation. If high variability indicates the scope for reduction, given differing approaches to service levels and also differing locations, the component costs could perhaps be tackled in order of priority as indicated by the numbers in brackets.

Table 5 **Cost and value indicators 2004-05**

Indicators	Lower quartile	Median	Upper quartile
Total property costs per m ² NIA	£73.4	£85.6	£101.5
Percentage change 2002-03 to 2004-05	0.8%	11.0%	20.2%
Total property costs per student FTE	£674	£900	£1,361
Percentage change 2002-03 to 2004-05	-3.0%	8.8%	20.1%
Total property costs and capital expenditure per student FTE	£1,126	£1,740	£2,596
Percentage change 2002-03 to 2004-05	-18.1%	11.5%	49.9%
Total residential property costs per bed space	£691.93	£930.07	£1,171.24
Percentage change 2002-03 to 2004-05	-4.9%	10.8%	24.1%

Table 6 **Comparison of levels of change in costs per m² and 2004-05 interquartile variability of those costs**

Levels of change in cost per m ²	Low interquartile variability	Medium interquartile variability	High interquartile variability
Low change (<10 per cent)	Rates (7)	Water and sewerage (6)	
Medium change (10 to 20 per cent)		Maintenance (5) Cleaning (4)	
High change (>20 per cent)	Energy (3)	Security and portorage (2)	Insurance (1)

Note: Numbers in brackets indicate suggested priority for reducing costs.

- b. One of the reasons why insurance costs are highly variable could be the different approaches towards self-insurance. The costs, although still small compared with energy, are rising sharply. The median increase of 18 per cent in insurance costs per m² compares with a 13 per cent increase in IRV per m², indicating the higher premiums being imposed on the sector.
- c. Since the data were collected, there have been further pressures on budgets from higher energy costs.

Space management

35. Space per student has reduced in 60 per cent of HEIs:

- a. Typical figures for overall space per student went down by 3 per cent between 2002-03 and 2004-05 with reductions achieved in nearly 60 per cent of HEIs, particularly for teaching space. These improvements were generally caused by student numbers rising faster than space.
- b. Office provision for academics and support staff has hardly changed, and significant

variations exist. This may indicate scope for substantial reductions in space, the savings on which can be channelled into cost reduction or quality enhancement.

36. Space provision varies greatly across the sector (see Table 7 and Figure 4):

- a. Greater space allocations are associated with (although not necessarily caused by):
- higher research input (to be expected)
 - difficult and old buildings, especially listed ones (again, to be expected)
 - poor building condition.
- b. Poor building condition is not directly linked to high space use; rather the connection seems to be that many older, more research-based institutions have more space and tend to have more poor quality buildings.
- c. HEIs with estates in poor condition and high space provision should consider options for developing a high quality, high utilisation approach.

Table 7 **Space utilisation 2004-05**

	Lower quartile	Median	Upper quartile
Total non-residential space NIA per student FTE	5.84 m ²	8.05 m ²	11.21 m ²
Percentage change 2002-03 to 2004-05	-9.8%	-2.5%	6.7%
Teaching space per student FTE	3.56 m ²	4.54 m ²	7.03 m ²
Percentage change 2002-03 to 2004-05	-11.7%	-3.9%	7.0%
Academic office space NIA per academic staff FTE	10.57 m ²	13.58 m ²	17.40 m ²
Percentage change 2002-03 to 2004-05	-6.6%	0.0%	7.7%
Support office space NIA per support office staff FTE	8.65 m ²	12.78 m ²	18.58 m ²
Percentage change 2002-03 to 2004-05	-9.6%	-1.8%	11.5%
Support space NIA per student FTE	1.63 m ²	2.23 m ²	3.02 m ²
Percentage change 2002-03 to 2004-05	-11.0%	-2.0%	12.3%
Residential occupancy rate (per cent)	93%	97%	98%
Percentage change 2002-03 to 2004-05	-2%	0%	1%

- d. Higher education has a high proportion of listed buildings: a quarter of HEIs have more than 20 per cent of their space listed. This means that internal refurbishment to achieve space improvements can be difficult or impossible. However, every opportunity needs to be taken to improve space performance even in these circumstances.
- e. HEIs with a high provision of teaching or research space per student, or with low income per m² for these types of space, may wish to investigate potential improvements.
- f. Some of the variations in space are difficult to explain. There would seem to be considerable opportunities for further space rationalisation of:
- support space¹ generally
 - office space for both academic and support staff.
- g. Occupancy rates for teaching space are also variable. This may be a result of inflexible buildings with inappropriate room sizes to meet modern teaching needs. Again, investment may be required to improve performance in this area.

Environmental sustainability

37. Environmental performance is improving but still has further to go (see Table 8):

- a. EMS has taken major strides forward in environmental monitoring, ahead of the public sector generally and also the private sector. HEIs may wish to examine their figures for individual buildings to ascertain how further improvements can be made.
- b. Overall, the two environmental indicators where there was a high enough sample to observe change showed impressive performance

Figure 4 **Variability of key indicators of space use**

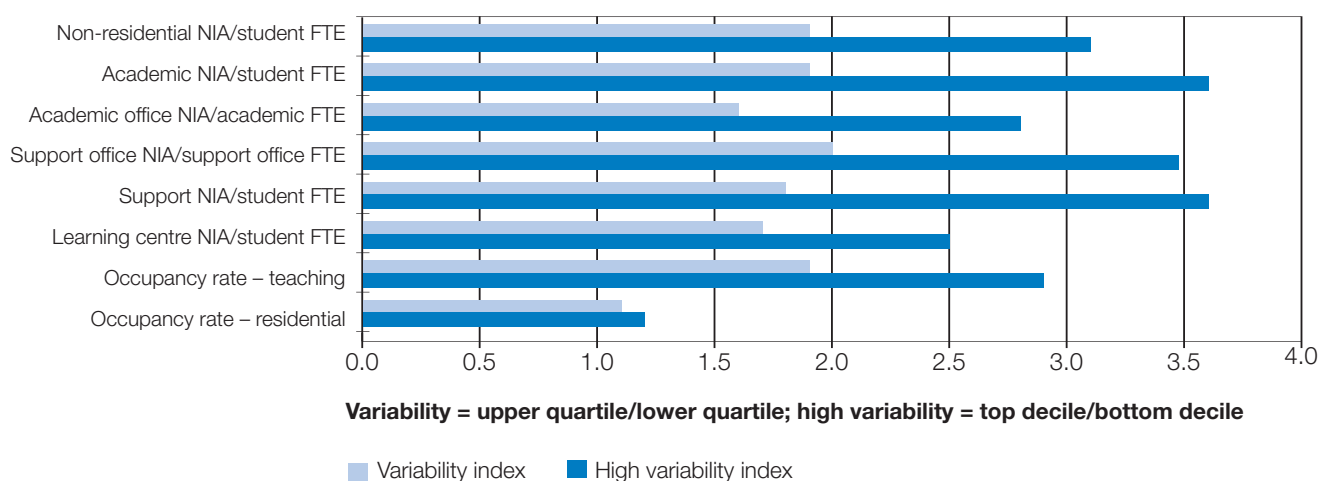


Table 8 **Energy and water consumption and waste indicators for all HEIs, 2004-05**

	Lower quartile	Median	Upper quartile
Energy consumption per student FTE	2,575 KWh	3,819 KWh	6,962 KWh
Percentage change 2002-03 to 2004-05	-8.7%	-1.4%	7.9%
Water consumption per student FTE	7.45 m ³	12.08 m ³	24.06 m ³
Percentage change 2002-03 to 2004-05	-21%	-6%	11%
CO ₂ emissions per student FTE	723 kg	996 kg	1,792 kg
Waste mass per student FTE	61 kg	121 kg	294 kg

¹ Support space comprises most of the non-teaching and non-research space of the HEI with the exception of residential space and space devoted to commercial activities and the like.

for the best performing HEIs: those in the lower quartile reduced consumption of energy by 9 per cent and of water by 21 per cent.

- c. However, even taking non research-intensive institutions (with research income accounting for less than 5 per cent of the total – see Table 9), the energy consumption per student varies between lower and upper quartiles of 2,200 and 3,600 kWh. This suggests that much of the variability is a reflection of management practices and investment, as well as underlying variations in space performance.
- d. This last point is important: the most effective way of reducing environmental impact per student is through improved space efficiency, space being probably the biggest environmental driver of all.

Nature or nurture?

38. Are variations in the performance ratios the result of different activities, management practice or investment? A strong clue can be obtained by examining the variation within the group of HEIs with very little research activity. Table 9 tracks the quartiles for all 70 institutions with less than 5 per cent of their total income associated with research.

39. Two immediate conclusions can be drawn:

- the results are typically 20-30 per cent lower for low research HEIs than for all HEIs
- the variability is less but there is still a 60 per cent difference between the quartiles. Part of this will be explained by location (at least for energy) and business profile, but it is also likely to be linked to the management approach and funding levels.

40. It would be helpful to do more research in this area to understand the performance drivers better.

Table 9 **Energy and water consumption and waste indicators: comparison of low research HEIs with all HEIs, 2004-05**

	Lower quartile	Median	Upper quartile
All HEIs			
Energy consumption per student FTE	2,575 kWh	3,819 kWh	6,962 kWh
Notional energy emissions of CO ₂ per student	723 kg	996 kg	1,792 kg
Water consumption per student FTE	7.45 m ³	12.08 m ³	24.06 m ³
HEIs with <5 per cent income from research			
Energy consumption per student FTE	2,198 kWh	2,995 kWh	3,627 kWh
Notional energy emissions of CO ₂ per student	610 kg	799 kg	980 kg
Water consumption per student FTE	7.07 m ³	8.49 m ³	11.47 m ³
Percentage difference (low research HEIs compared with HEIs)			
Energy consumption per student FTE	-15%	-22%	-48%
Notional energy emissions of CO ₂ per student	-13%	-18%	-45%
Water consumption per student FTE	-5%	-30%	-52%

Condition and repair

41. The overall condition of the HE estate has improved since 2002-03, and there has been a near doubling in capital investment (see Table 10):

- a. The proportion of the estate in good condition for a typical HEI has grown by nearly 3 per cent over the two years 2002-03 to 2004-05. This is quite a large increase and it looks set to continue given ongoing levels of capital investment.
- b. The upper quartile improvement is even more impressive, with a 12.4 per cent increase.
- c. Nevertheless, the condition of the estate is still one of the most important challenges facing the sector: more than 30 per cent of the total stock is in poor condition.
- d. However, there are grounds to believe that the returns made by HEIs about the condition of their buildings are not as consistent as they should be. The EMS Steering Group will address this subject in 2007.
- e. The investment in property is highlighted by the increase in combined repair and capital spending as a percentage of insurance replacement value (IRV). This increased by 7 per cent over the two years, at a time when IRV was increasing at about 10 per cent a year. However, the variation between HEIs is large and the lower quartile result shows a surprising 36 per cent reduction, apparently a result of previous capital expenditure.
- f. 'Backlog affordability' is a simple ratio of HEI income divided by the cost of backlog work required to bring the estate into good condition and compliance with legislation. The typical HEI has six times more income than backlog costs (that is a ratio of six). However, 34 per cent of HEIs have a ratio of four or less, which represents a high level of risk for these institutions.

Table 10 **Condition of the higher education estate 2004-05**

	Lower quartile	Median	Upper quartile
Non-residential space in good condition	52%	69%	84%
Percentage change 2002-03 to 2004-05	-4.4%	2.6%	12.4%
Residential space in good condition	57%	80%	92%
Percentage change 2002-03 to 2004-05	-1.1%	0.0%	7.4%
Ratio of maintenance costs and capital expenditure to IRV overall	3.1%	4.9%	7.3%
Percentage change 2002-03 to 2004-05	-36%	7%	92%
Non-residential cost to upgrade to 'good' as percentage of IRV	3.4%	8.7%	15.6%
Percentage change 2002-03 to 2004-05	-28.2%	-10.2%	9.4%
Residential cost to upgrade to 'good' as percentage of IRV	5.0%	9.4%	15.9%
Percentage change 2002-03 to 2004-05	-27.4%	-4.4%	19.8%
Non-residential backlog affordability score	3.11	6.07	12.80
Percentage change 2002-03 to 2004-05	-7.5%	8.6%	27.9%
Residential backlog affordability score	0.52	0.81	2.24
Percentage change 2002-03 to 2004-05	-18.7%	2.6%	25.3%

Annex A

Summary statistics

Table 11 Estimated totals in UK higher education estates, 2000-01 to 2004-05

Year	2000-01	2001-02	2002-03	2003-04	2004-05
Number of HEIs	160	163	163	163	161
Estate size					
1. Total gross internal area of the UK HE estate	24.0M m ²	24.4M m ²	24.6M m ²	24.9M m ²	25.2M m ²
2. Total net internal area of the UK HE estate	17.7M m ²	18.0M m ²	18.2M m ²	18.4M m ²	18.6M m ²
3. Total net internal area: teaching space	5.6M m ²	5.7M m ²	5.7M m ²	5.6M m ²	5.5M m ²
4. Total net internal area: research space	2.5M m ²	2.6M m ²	2.6M m ²	2.7M m ²	2.8M m ²
5. Total net internal area: support space	3.4M m ²	3.4M m ²	3.6M m ²	3.6M m ²	3.9M m ²
6. Total net internal area: residential space	4.9M m ²	5.0M m ²	4.9M m ²	4.9M m ²	4.9M m ²
7. Insurance replacement value of total estate	£31.0bn	£33.6bn	£35.6bn	£38.9bn	£43.3bn
Total costs					
8. Total (revenue) property costs	£1.37bn	£1.40bn	£1.45bn	£1.55bn	£1.67bn
9. Maintenance expenditure	£446M	£456M	£459M	£507M	£533M
10. Capital expenditure	£1.0bn	£1.2bn	£1.7bn	£1.7bn	£1.9bn
Age and condition					
11. Proportion of non-residential space constructed pre-1940	23%	22%	21%	25%	24%
12. Amount of non-residential and residential space in categories C and D	8.55M m ²	8.75M m ²	8.53M m ²	8.44M m ²	8.7M m ²
13. Total backlog cost of maintenance (inc residences)	£2.7bn	£3.1bn	£3.7bn	£3.9bn	£4.3bn
Energy and water consumption					
14. Energy consumption total	7,045M kWh	7,452M kWh	7,277M kWh	7,742M kWh	7,771M kWh
15. Water consumption	25.4M m ³	26.2M m ³	25.6M m ³	25.6M m ³	31.1M m ³
16. Estimated CO ₂ emissions	n/a	n/a	n/a	1.9M tonnes	2.0M tonnes
Business indicators					
17. Total income	£13.4bn	£13.9bn	£14.9bn	£16.1bn	£17.3bn
18. Student FTEs	1.36M	1.37M	1.43M	1.47M	1.49M

Table 12 **Assumptions used to produce data in Table 11**

Row number in Table 11	Comment
All	The best possible estimate has been used consistent with a changing stock of HEIs, mergers and other factors.
1	For HEIs unable to provide a gross internal area for the entire estate, a total has been estimated by grossing up the net area. Where data are missing, an estimate has been based on previous data returns. Where no figure is available for the residential estate, no total gross internal area is available.
2	For institutions unable to provide a total net internal area for the entire estate, the area has been estimated by scaling down the gross area. Where data were missing, an estimate has been based on the 2003 data return. Where no figure is available for the residential estate, no total net internal area is available. A number of institutions are unable to provide a net internal area for residences, thus precluding presentation of total net internal area.
3-5	The actual area of categories of space at institutions unable to make returns has been estimated by assuming those HEIs have an average proportion of space types. Support space includes learning resource centres, libraries and open access computer space available for general use.
6	For institutions unable to provide a total net internal residential area for the entire estate, the area has been estimated by scaling down the gross residential area. Where the number of bed spaces has been provided by HEIs, the net residential space has been estimated by application of the average space per bed space.
7	Insurance replacement values (IRV) were provided by 160 UK HEIs for 2003-04. In previous years the IRV per m ² gross space has been used to estimate an IRV for institutions where no data were available.
8	Total property cost includes rateable value (as a proxy for rental value), rates, service charge, insurance premiums, energy, water and sewerage, maintenance (revenue only), cleaning, and internal and external estate management costs. No capital expenditure is included in this figure. Where HEIs were unable to return a total property cost in accordance with EMS, an estimate was made by adopting the mean cost per m ² in respective countries.
9	Where HEIs were unable to return a total maintenance cost in accordance with EMS, an estimate was made by adopting the mean cost per m ² in respective countries.
10	Capital expenditure totals have been calculated from annual returns to the Higher Education Statistics Agency (HESA). Historical figures will differ from previous reports due to the use of HESA data in place of the HEI return.
11	Proportions of space have been shown for each country that reflect the mean proportions of pre-1940 space returned by HEIs.
12	For HEIs unable to classify the proportion of space in poor condition (categories C and D), a mean average proportion of total net area was assumed to be in those categories.
13	For HEIs unable to estimate the cost of upgrading 'poor' space, respective average costs per m ² to upgrade have been applied to total gross space data at institutional level. Historical figures will differ from previous reports due to a different method of calculation.
14	For HEIs unable to provide total estate energy consumption data, an estimate has been made using the student FTE population and the median reported consumption per student FTE in each year.

Row number in Table 11	Comment
15	For HEIs unable to provide water consumption volumes, an estimate has been based on student FTE population and the median reported consumption per student FTE in each year.
16	CO ₂ emissions have been provided by HEIs which have, in many instances, used specific local CO ₂ conversion factors depending on the specific energy sources and processes. Where no specific conversion data were accessible, an estimate of CO ₂ emissions has been made using standard conversions of consumption data.
17	Income figures supplied by HESA for all HEIs in year. There may be some small discontinuities in the time series.
18	Total student FTEs supplied by HESA for all HEIs in year. There may be some small discontinuities in the time series.

Table 13 **Balance of change for key ratios, 2002-03 to 2004-05**

		Balance of change²	Subjective rating
Income	Total property costs to HEI income	-11%	Good
	HEI income per m ² NIA	60%	Very good
	Teaching income per m ² NIA	61%	Very good
	Research income per m ² NIA	13%	Quite good
	Residential income per m ² NIA	27%	Good
Space	HEI income per bed space	40%	Very good
	Non-residential NIA per student FTE	-6%	Quite good
	Academic space per student FTE	-12%	Good
	Academic office NIA per academic staff FTE	4%	Quite disappointing
	Support office NIA per support office staff FTE	6%	Quite disappointing
	Support NIA per student FTE	-3%	Quite good
	Residential occupancy rate	0%	Little change
Environment	Energy consumption kWh per student FTE	-1%	Quite disappointing
	Notional energy emissions (kg CO ₂) per student FTE	-18%	Good
	Water consumption m ³ per student FTE	-13%	Good
Condition	Percentage non-residential GIA in good condition	15%	Good
	Percentage residential GIA in good condition	8%	Quite good
	Cost to upgrade (non-residential space) as a percentage of IRV	-27%	Very good
	Cost to upgrade (residential space) as a percentage of IRV	-13%	Good
	Repair and capital expenditure to IRV	7%	Quite good
	Non-residential backlog affordability score	27%	Very good
	Residential backlog affordability score	2%	Little change

² This is the percentage of HEIs with scores rising by more than 10 per cent, less the percentage with scores falling by at least the same amount. Some of these ratios are subject to the effects of inflation, which should be taken into account when interpreting the numbers.

Table 14 **Comparison of Scotland and Wales and groups of HEIs with median results for all UK HEIs, 2004-05**

	Median	Peer group median as percentage difference from UK median					
	All HEIs	England	Scotland	Wales	Research income >20%	Research income <10%	Total income <£30M
HEI income (D1) per m ² NIA	£858	4%	-7%	-9%	8%	3%	-14%
Total property costs (D26) per student FTE (D4, C1)	£900	-6%	31%	7%	56%	-21%	6%
Total property costs (D26) per m ² NIA (D12, C1)	£86	2%	-5%	-17%	2%	-1%	-3%
Core teaching space (D12, C3) per taught student FTE (D4, C4)	2.72 m ²	-3%	18%	22%	-5%	2%	67%
Total non-residential NIA (D12) per student FTE (D4)	8.05 m ²	-7%	30%	10%	39%	-22%	6%
Building condition: percentage GIA in Condition A and B (C13)	69%	2%	-22%	7%	-5%	1%	13%
Cost to upgrade condition C+D to B as percentage of IRV (C13)	9%	-7%	90%	-26%	-21%	1%	-17%
Utilisation rate – teaching space	26%	6%	-17%	-13%	12%	2%	-7%
Office NIA (D12) per student FTE (D4)	1.80 m ²	-1%	18%	10%	53%	-16%	-18%
Core teaching space (D12, C3) per taught student FTE (D4, C4)	2.72 m ²	-3%	18%	22%	-5%	2%	67%
Utilisation rate – teaching space	26%	6%	-17%	-13%	12%	2%	-7%
Non-residential operating costs (D29-34) per student FTE	£444	-2%	32%	-8%	51%	-25%	31%
Energy consumption (D38A) per student FTE (D4, C13)	2,898 kWh	-9%	76%	-9%	92%	-26%	3%
Notional energy emissions of CO ₂ per m ² GIA (D11, C13)	72.3 kg	0%	6%	-21%	24%	-7%	-14%
Water consumption (D38B) per student FTE (D4, C1)	12.08 m ³	-6%	54%	-13%	121%	-34%	-13%
Recycled waste proportion	12%	-5%	17%	48%	7%	4%	-13%

Note: References in brackets are to the source data in EMS.

Annex B

Glossary and abbreviations

Academic space/staff	Space used for teaching and research and for its support (faculty offices, for example). Also all staff who tend to work in such areas.
Backlog affordability	The ratio of HEI income to the size of the repair backlog. The higher the number the more affordable is the repair backlog.
DEL	Department for Employment and Learning (Northern Ireland)
EMS	Estate Management Statistics
FTE	Full-time equivalent
GIA	Gross internal area
Good/poor condition	EMS classifies all space in four categories (A-D). For EMS purposes, the top two categories (A, B) are described as being in good condition and the bottom two (C, D) in poor condition
HE	Higher education
HEFCE	Higher Education Funding Council for England
HEFCW	Higher Education Funding Council for Wales
HEI	Higher education institution
HESA	Higher Education Statistics Agency
Income per m²	The total income of the HEI divided by the total floor space (based on net internal area)
IRV	Insurance replacement value
m²	Square metres of space
Net internal area (NIA)	A measure of the total amount of space within the external walls, excluding major circulation space and other major elements.
Occupancy rate (teaching)	The overall percentage rate at which teaching space is occupied, reflecting the average proportion of space utilised and the average proportion of teaching workspace capacity used
Property cost to income ratio	The ratio between total property costs (see below) and HEI income
Repair backlog	The costs of remedying all the sub-standard property and ensuring the estate complies with legislation, as measured by the HEI
Residential occupancy rate	The average percentage of bedrooms under the direct control of the HEI that are occupied throughout the academic terms
SFC	Scottish Funding Council

Student FTE	Student full-time equivalent
Support space/staff	Support space comprises most of the non-teaching and research space in the HEI apart from the residential space and any space devoted to commercial activities. Also all staff who tend to work in such areas.
Teaching/research income per m²	The total teaching and research income of the HEI divided by the total floor space (based on net internal area) allocated to teaching and research respectively. Since support space that does not generate income is excluded from these numbers, the teaching and research income per m ² is almost always higher than the overall income described above.
Total property costs (TPC)	Total property cost includes rateable value (as a proxy for rental value), rates, service charge, insurance premiums, energy, water and sewerage, maintenance, cleaning, and internal and external estate management costs. No capital expenditure is included in this figure.



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