

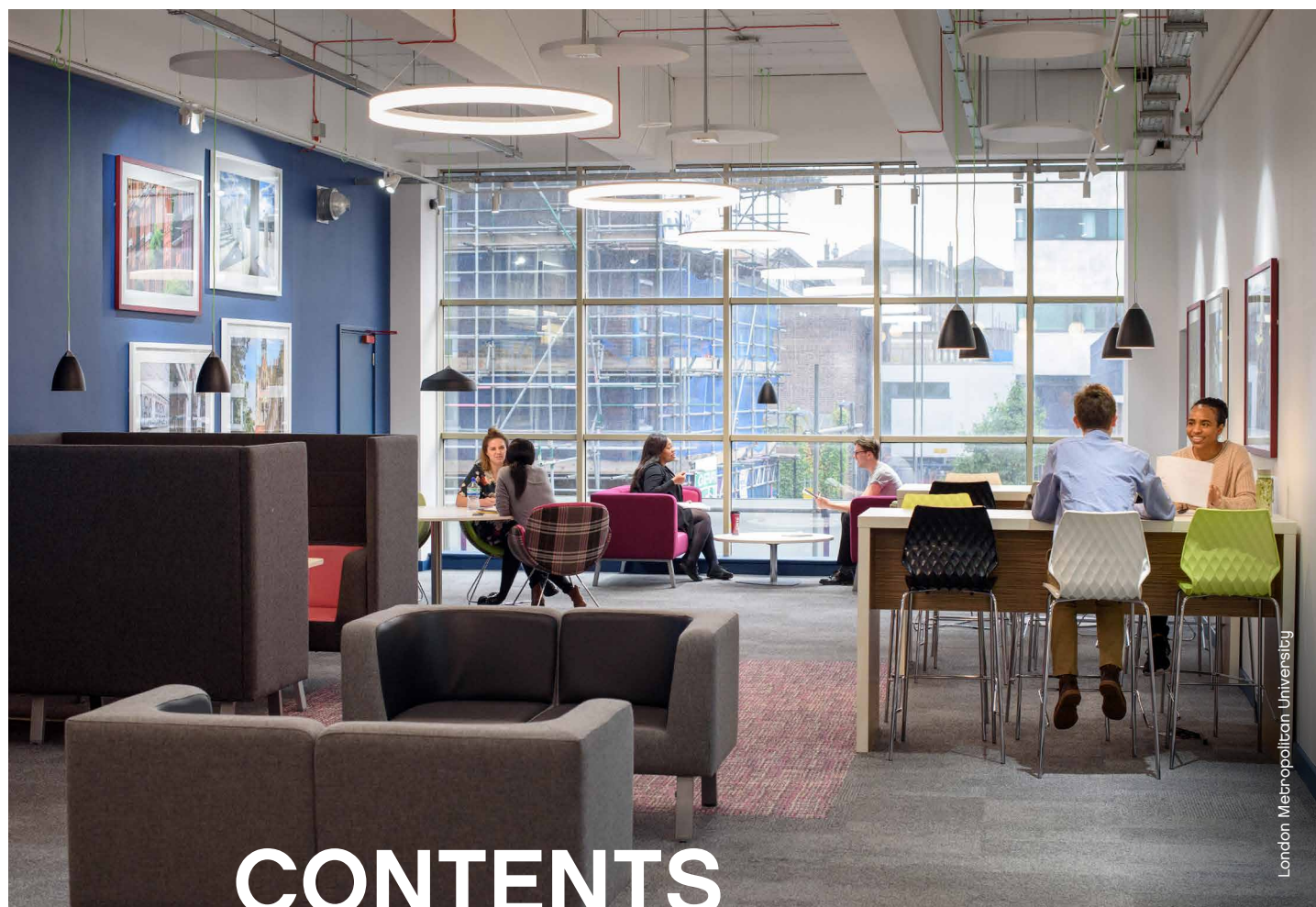


ASSOCIATION OF UNIVERSITY
DIRECTORS OF ESTATES

Excellence in Estates
and Facilities

AUDE Higher Education Estates Management Report 2017

Summary, insights and analysis
of the 2015/2016 academic year



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1 INTRODUCTION



SIR IAN DIAMOND

The UK has an outstanding higher education sector, operating effectively in a continuing period of change and turmoil. UK universities continue to deliver world class education, undertake world class, often impactful research and engage with their communities in a multitude of exciting ways. Inevitably our intake of students, staff and researchers, with the highest of aspirations, will rightly challenge us to provide the best of environments and a need to keep the estates up to date and attractive, whilst being in use longer hours to get the best from the available resources. The estate comprise of everything from innovative and impressive learning, teaching and research facilities, social spaces, entertainment venues, sports facilities, restaurants and cafes, theatres, libraries, hospitality and residential accommodation to space for start-up companies, enterprise space and collaboration spaces with business and companies.

The physical estate touches all and ensuring the provision and support of the estate falls to estates and facilities teams. We have seen cost increases across all elements and need to continue to demonstrate efficiency and effectiveness whilst maintaining standards and quality.

The benefit of the latest Higher Education Statistics Management for 2017 shows that overall costs have reduced slightly, despite the increase in costs in some areas highlighted in the report. The additional information on the segmentation of the sector delves into additional ways to benchmark, see trends, showcase efficiency, examine questions around sustainability and support best practice as well as illustrate the overall competence of the sector. The use of case studies to share best practice and review innovative ways of meeting challenges creates food for thought and further opportunities for all of us to explore.

The sector continues to make more of the estate as demonstrated by the increase in income per meter squared and continues to drive down the use of carbon, despite a significant proportion of research undertaken having a high correlation to increases in utility use. We know that income generated from other activities is inevitably invested in the estate and equipment to support learning and research.

AUDE is acutely aware that recent tragic events at Grenfell in relation to cladding and changes to building regulations are likely to have further impacts on estates.

I trust that you find this report as useful as I have and that it will support you in the important roles that you fulfil as we all continue to strive for excellence in Estates & Facilities.

Professor Sir Ian Diamond DL FBA FRSE FAcSS

University of Aberdeen



Income in the sector has continued to increase. Total income has increased by 4.5% lower than last year's 8% increase. For some institutions growth continues to be the order of the day with increasing student numbers and increasing income. But for some the story will be of reducing numbers of students and a consequent fall in income.

Costs have increased, which is one major factor in the increasing total property costs. Wages make up a large part of total property costs and as salary costs increase, this drives the cost of operating University property up. This will be a greater impact for those institutions where income is not increasing at the same rate as costs.

The demographics of the UK shows that the number of people who are available to go to University will continue to reduce for the next 4 or 5 years to a historic low, before numbers start to recover again. There is likely to be a continued reduction in overall number of home undergraduates attending University until the number of 19 year olds increases when we are likely to see numbers start to increase again. This means that whilst some institutions will continue to maintain (and for some, increase) their income, for others it will inevitably mean a reduction in numbers and consequent income. This will mean continued downward pressure on costs, this will mean looking at how to maintain the level of service required for reduced costs, as well as the potential to reduce the amount of estate required to deliver the services.

Across the sector there is a sustained level of capital expenditure which for the first time exceeded £3bn in the year 2015/16. This expenditure is naturally skewed towards the larger institutions, with 4 institutions spending over £100m in the year. The median value remains the same as last year suggesting that for most institutions capital expenditure is on a par with where it has been for several years.

The investment in new estate will impact on the running costs of institutions as these new buildings come on stream, as they are likely to be more complex than buildings they replace, and are also likely to be well used. As a consequence, notwithstanding their undoubtedly 'green' credentials, operating costs are likely to be higher.

The analysis of the key performance indicators shows that Universities are continuing to improve most of the metrics. Costs have remained relatively stable, despite the continued upward pressure on costs. The utilisation rate of institutions (measured by income per m²) continues to rise as income increases.

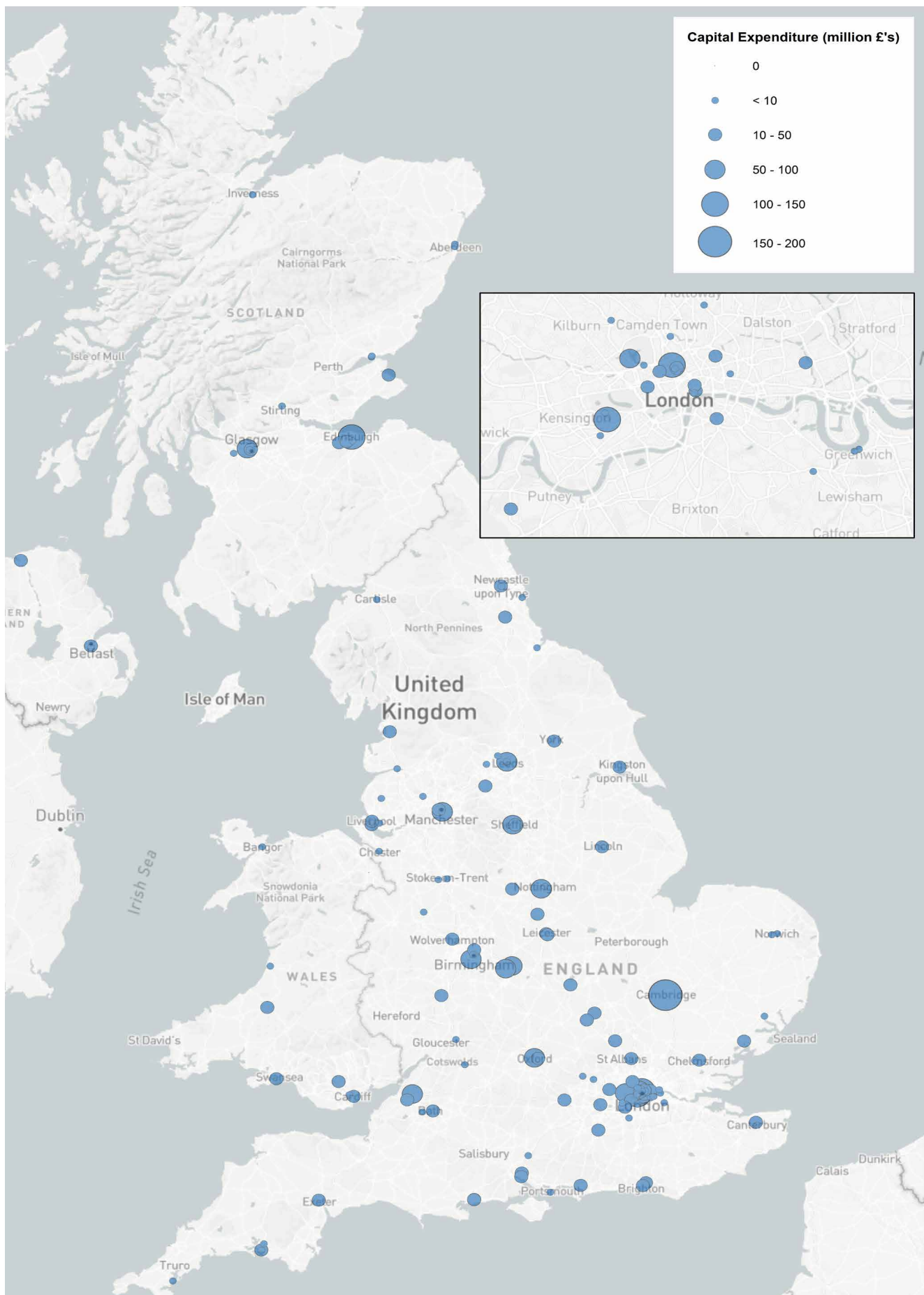
The investment in the estate brings with it improvements in the quality and suitability of estate, although the measures suggest this rate of increase has slowed. The overall cost of upgrading the remaining estate has decreased because of the investment in new buildings and refurbishments.

The age of the University estate is getting younger with the amount of investment, however still approximately one third of the estate was built between 1960 and 1979. This estate will be at the end of its design life soon (if not already) and is likely to need substantial refurbishment or replacement, hence demanding continued capital investment

Key performance indicators change slowly, given the size of the estate. Where KPIs look at the number of FTEs in the sector, there is a considerable impact on the changing number of undergraduate students. As discussed earlier, the demographics suggest that there will be fewer home undergraduates over the next 5 or so years until the numbers start to pick up again. This is bound to reduce some of these KPIs in line with reduced FTEs.

The sector will continue to be concerned about the impact of Brexit. Specific areas of concern within the estates are the potential for increases in construction costs based on a weakening Sterling making imports more expensive, the potential increase in labour costs both because of a possible restriction on immigration as well as the threat of this restriction. Given the impact that overseas students have on the income of Universities, this needs careful monitoring. Government policy will clearly have a very direct impact in areas such as visas and immigration numbers. However, it is the impact on research income that concerns a number of institutions.

The impact of the tragedy at Grenfell Tower is also having an impact. The notable direct consequence is the immediate surveying of properties across the country, some of which are student accommodation. There are bound to be towers which are perceived to have risks which need to be addressed. Universities will have to work with third party owners to ensure that risks are mitigated and concerns are addressed. It is likely that there will be a wider impact with the potential for a greater review of regulations across our estates.





The overall income in the sector has increased by 4.5%, showing the strength of the sector, however the increase was lower than last year's. Teaching income has grown by just under 6% (very much the same as last year) and other income has grown by 7.5% (again down on last year's 9.5% growth). Research income has remained at the same level as last year, and there is concern that EU money may reduce further reducing research income in the future.

In terms of income distribution, two institutions generated over £1bn in academic income (i.e. from teaching and research), and a further 9 institutions generated over £500m from their academic activities.

The median income figure is £120m, which is about the same as it was last year. 26 institutions generate over £250m, up from 24 last year. These 26 institutions generate £13.5bn in academic income, which is roughly half (48%), of the total academic income across the whole sector.

There are also 40, mainly specialist, institutions which generated under £50m.

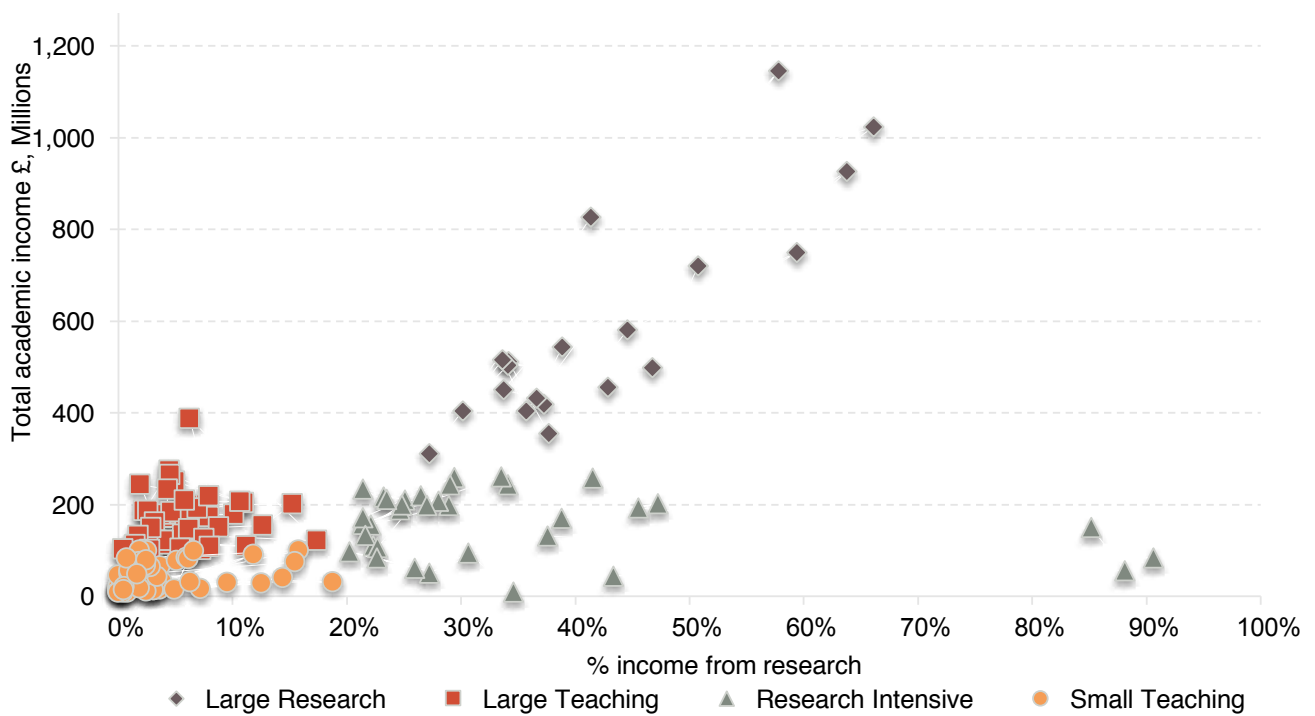
'Other' continues to play a significant part in some institutions' income, with a total of £4.7bn other income generated across the sector. Over 50% of this income is generated by 15 institutions.

We have introduced an element of segmentation this year. The aim of this is to enable a better comparison between institutions of some particular key performance indicators. These indicators are different depending on the type of institution, those with higher research activity do require more estate per fte and hence it is reasonable to compare research focussed institutions.

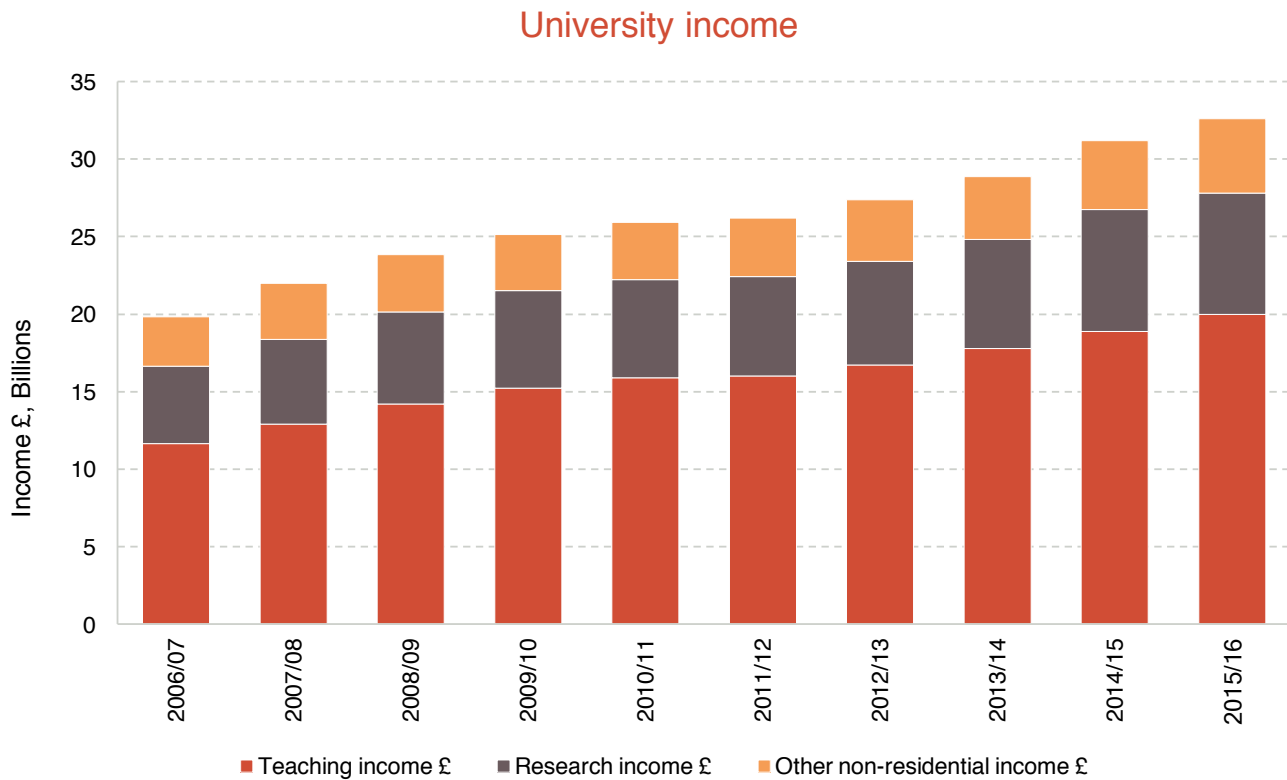
The segments have been created as follows:

- Research institutions are those which generate over 20% of their income from research. This has further been split between the large research institutions with over £300m of academic income, and the research intensive institutions with less than £300m academic income.
- Teaching institutions are ones which generate over 80% of their income from teaching. This has further been split between large teaching institutions with over £100m income, and the smaller teaching institutions with less than £100m income.

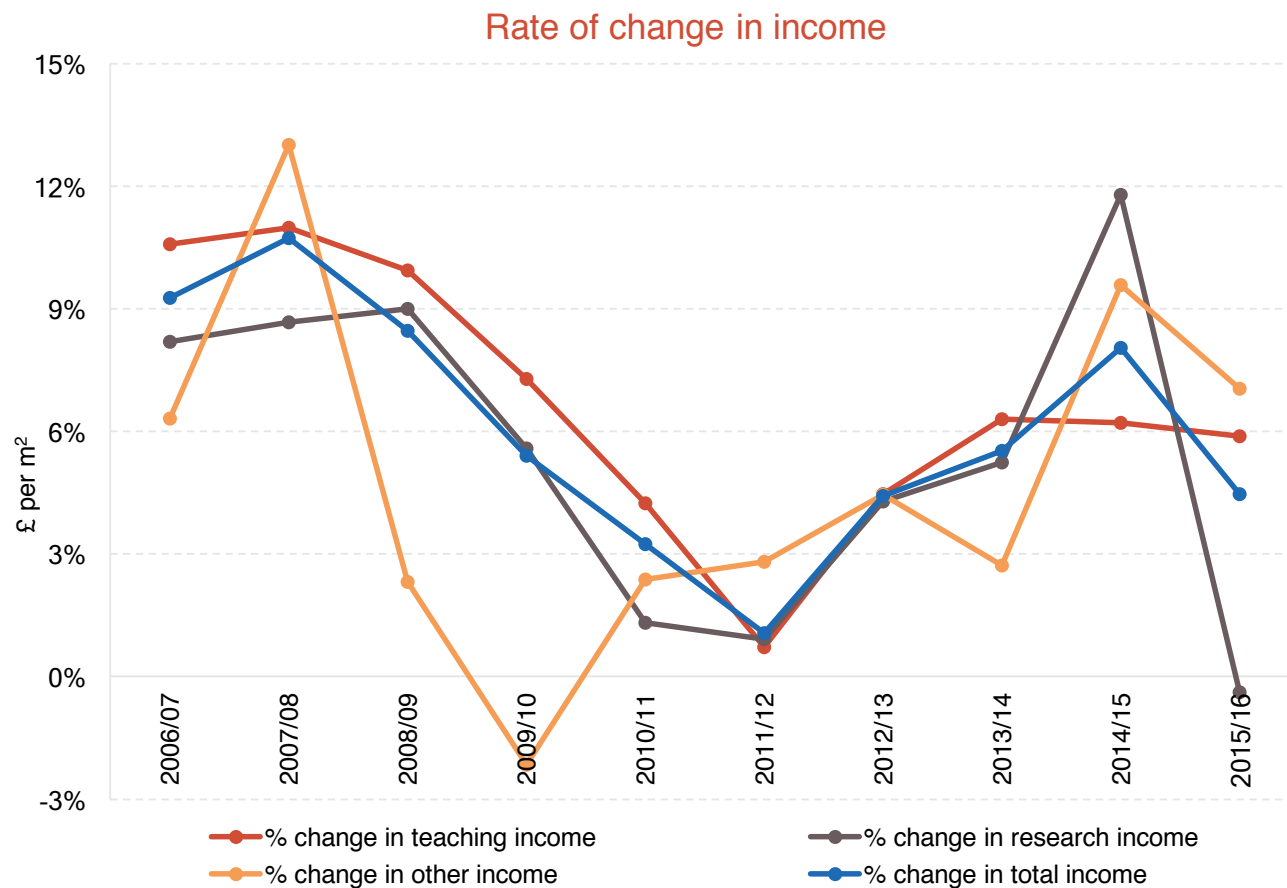
3.1. UNIVERSITIES BY % RESEARCH AND SIZE SHOWING SEGMENTS.



3.2. UNIVERSITY INCOME

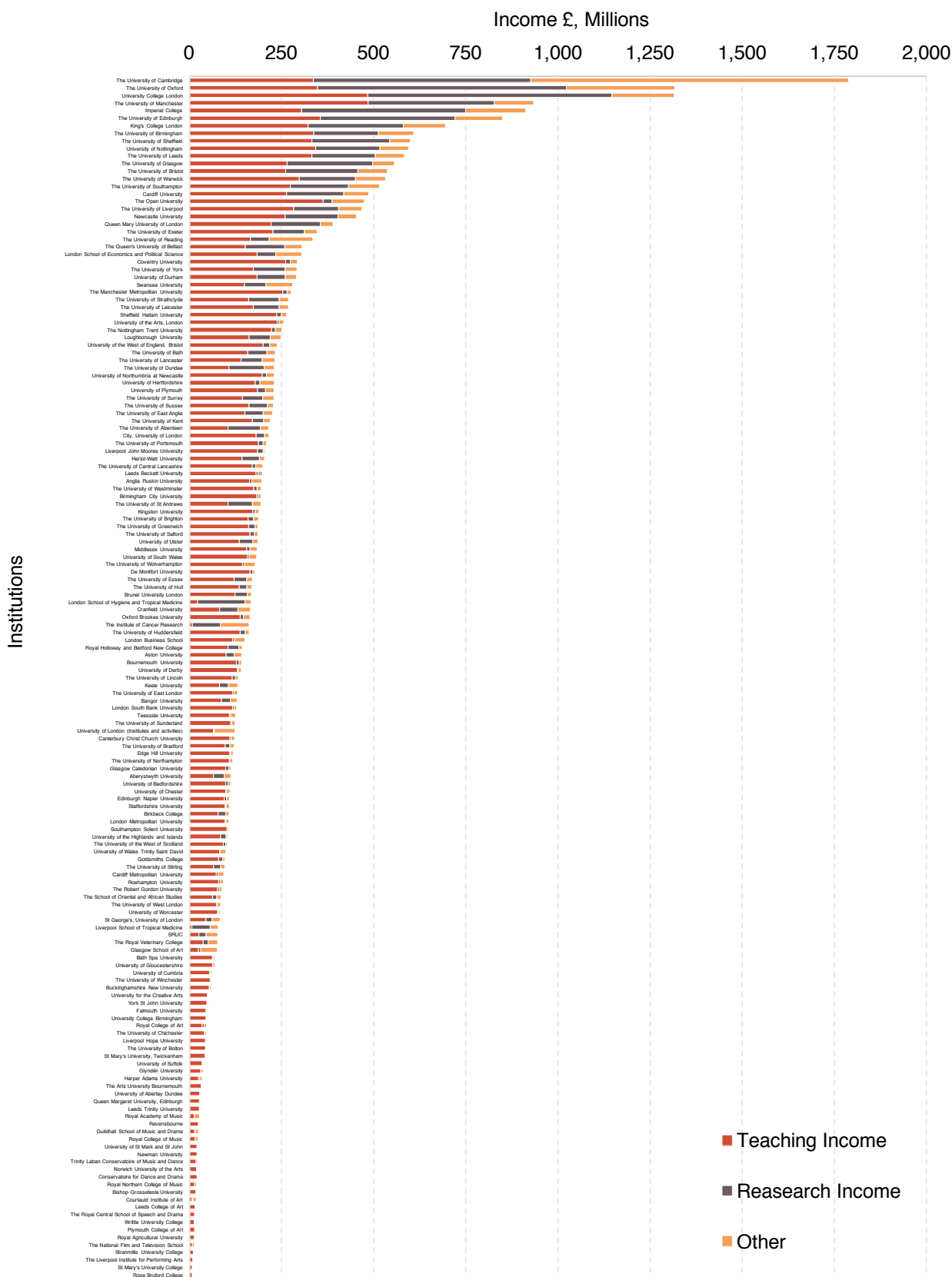


3.3. RATE OF CHANGE OF INCOME

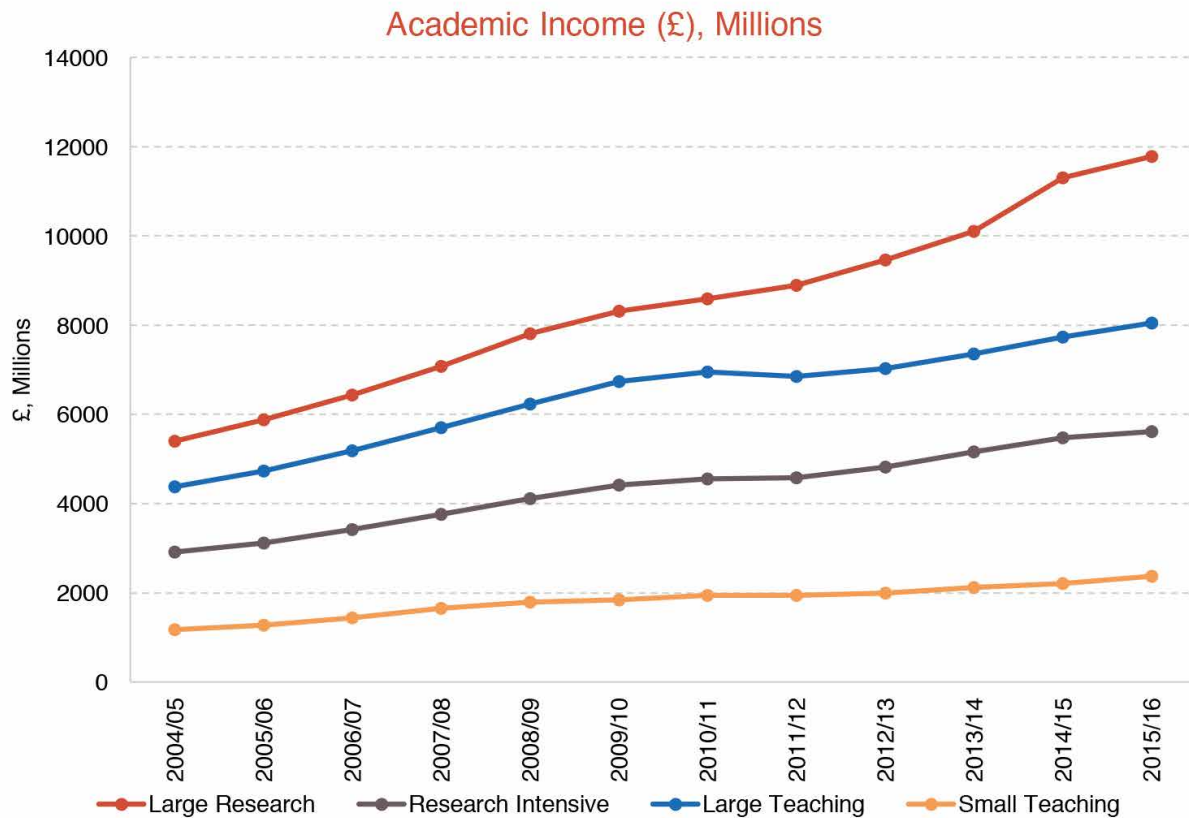


3.4. TOTAL INCOME BY INSTITUTION

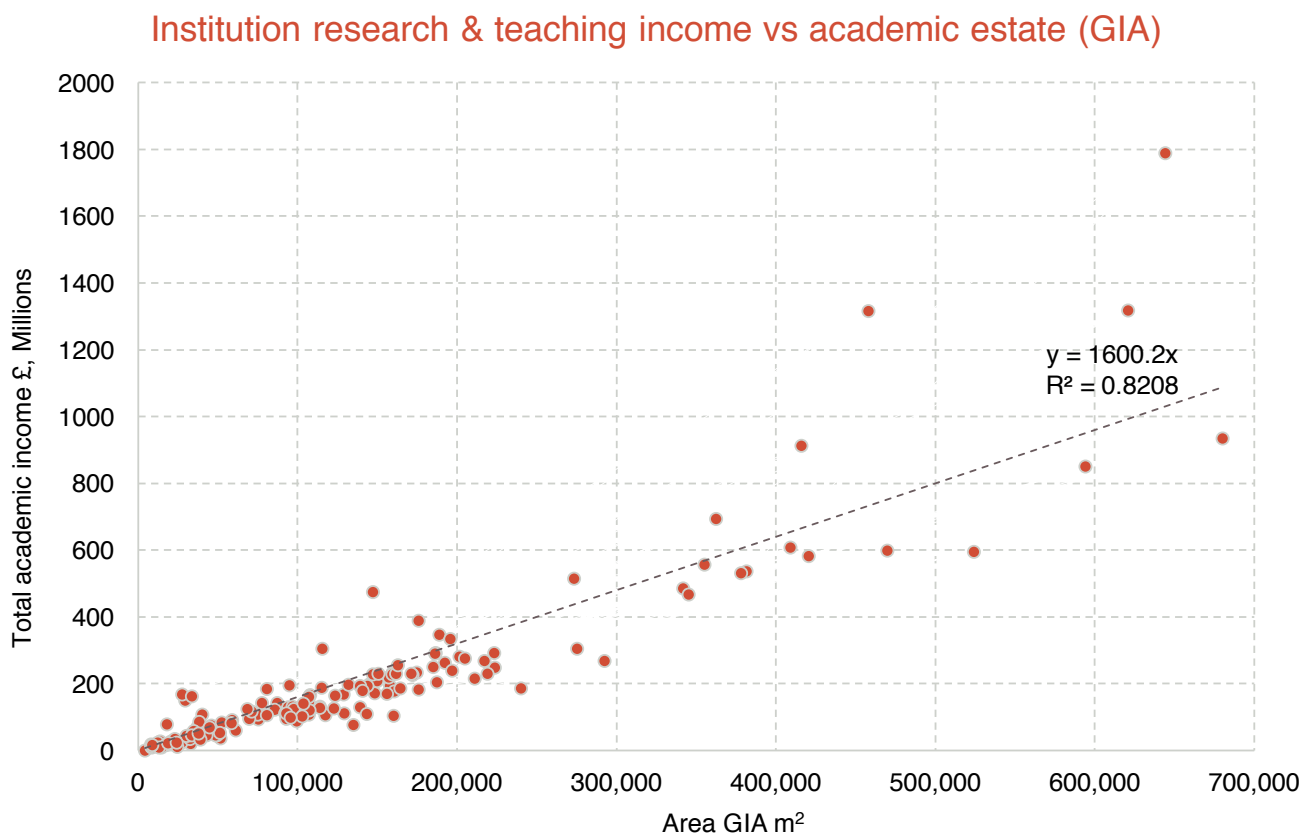
Total Income (non-residential) by institution

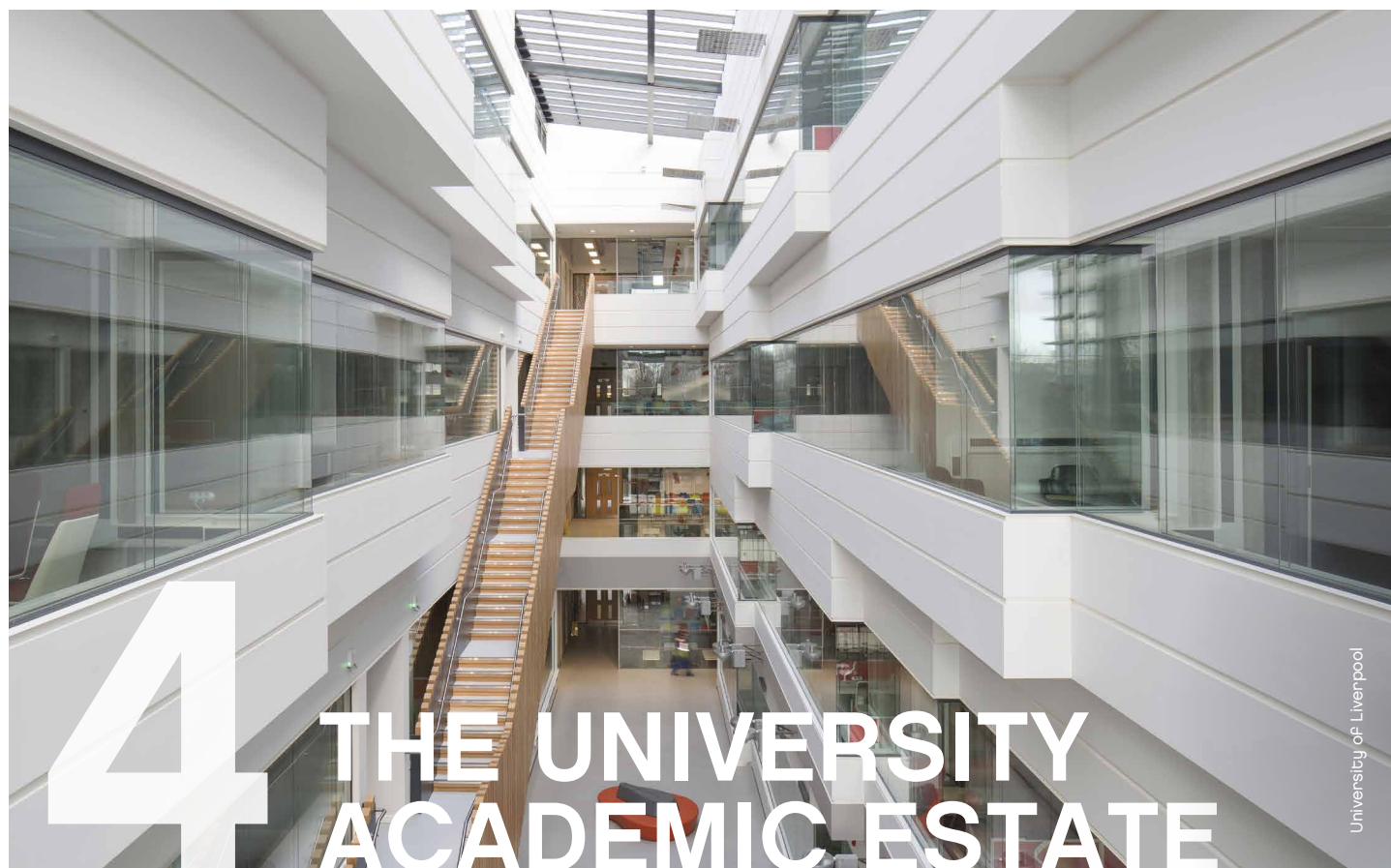






3.5. INCOME AGAINST ESTATE SIZE





The overall size of the University estate continues to grow. It is now nearly 22,000,000m², gross internal area, with a net figure of 14,500,000m². This represents an increase of 300,000m² NIA (over 500,000m² GIA). This represents a similar increase in estate as there was last year, representing an increase of 2.2% of the total estate.

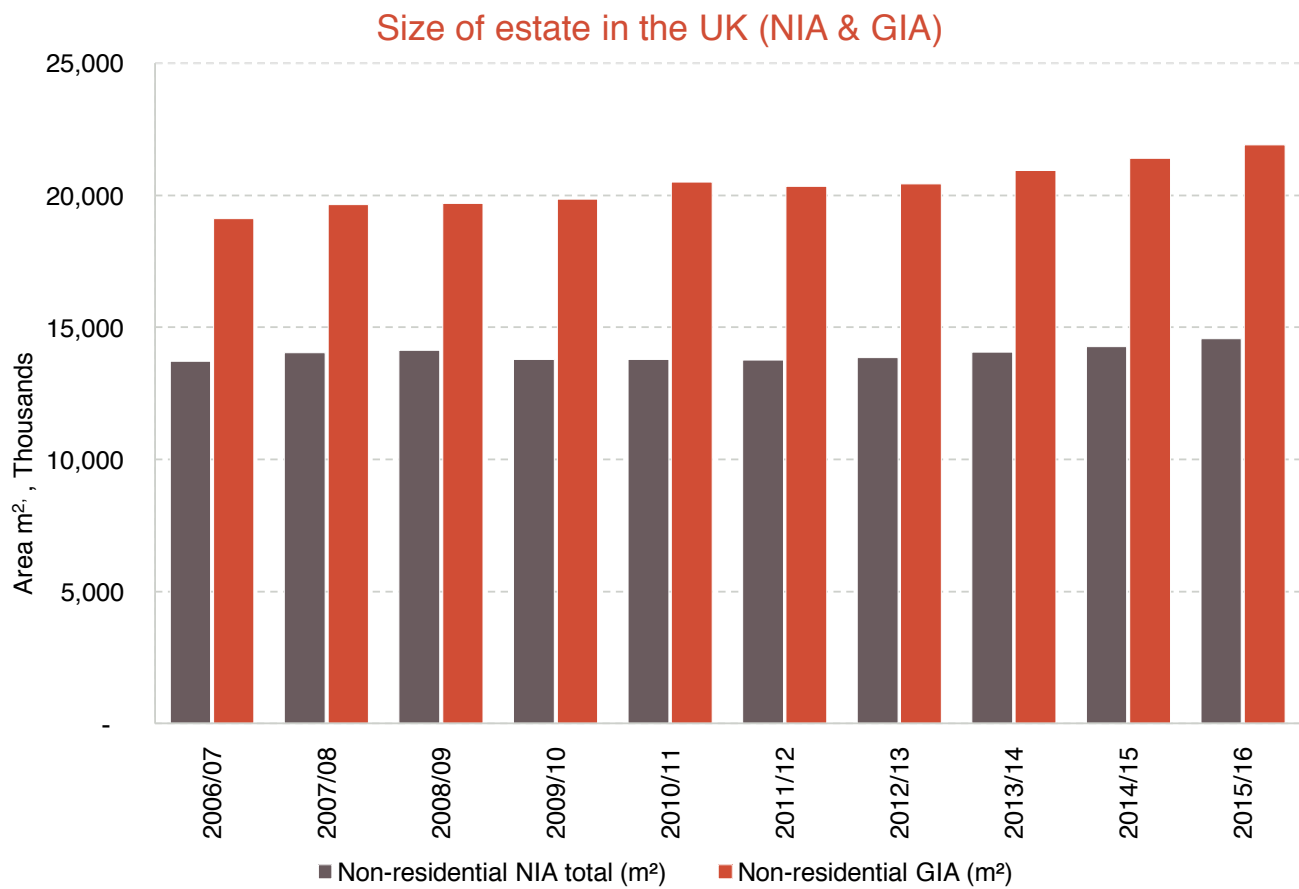
The development of new estate is often part of long and complex capital programmes. For these, one might expect to see a reduction in estate at the end of the programme as old space (no longer fit for its purpose) is finally disposed of. For others, this is the development of new estate which adds to the University's overall holdings. So, whilst there is an increase in the overall size of the estate, it also represents an improvement in the condition, quality and functional suitability of the estate, and it is likely that older estate will be disposed/demolished as part of the overall programmes that Universities are completing.

New estate coming on stream also can influence the balance between the net area (i.e. the useable area of a building) and the gross (i.e. the total internal area) of institutions. There are a number of reasons for this including such as complex buildings requiring more plant rooms to support the increasing servicing requirements of the building and the greater use of atriums and reception areas.

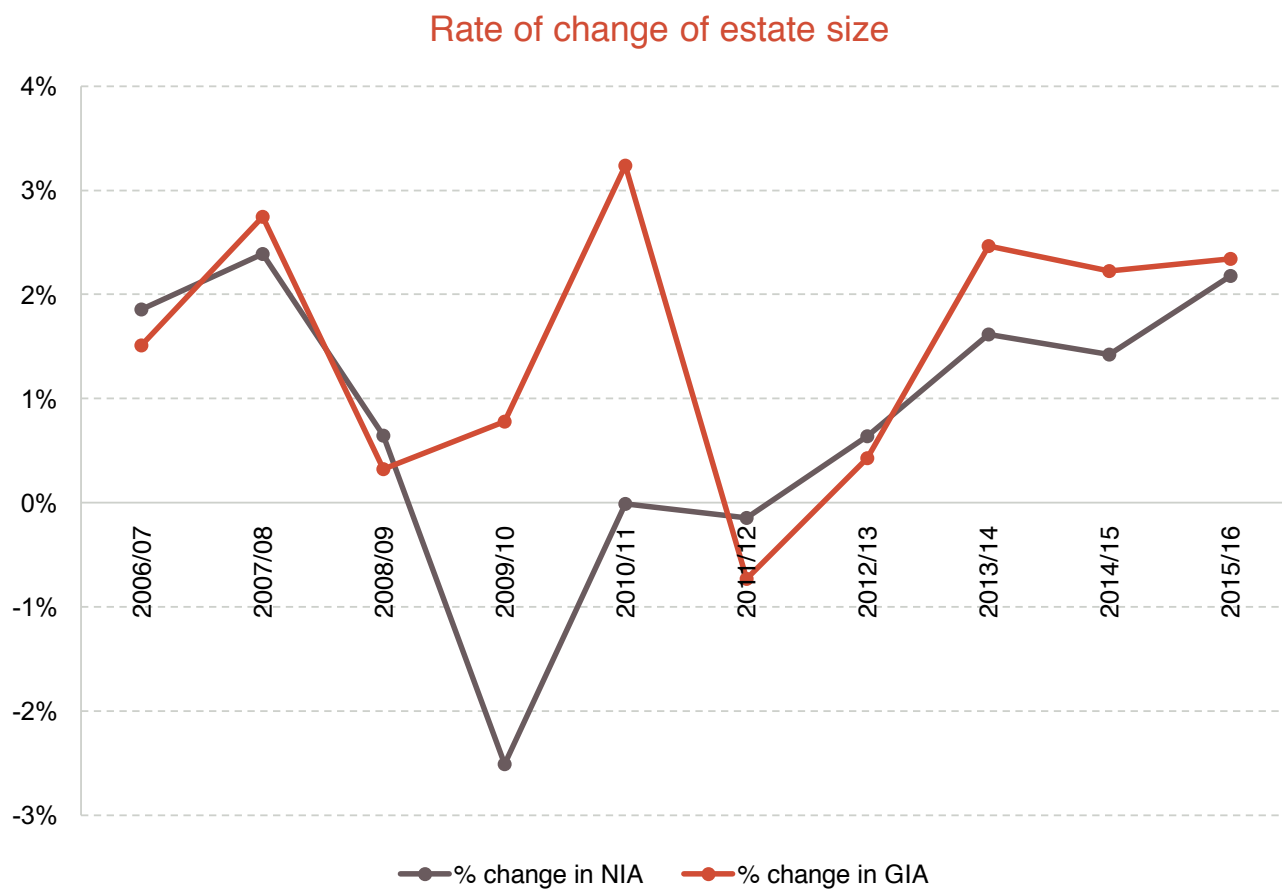
In terms of overall student and staff numbers, we have seen very limited growth in either number over the last year. Taught students have increased from 1,594,000 to 1,620,000 (an increase in 26,000). Staff and research students increased by c2,000 FTE each. The general projection is that the likely size of the undergraduate population will remain relatively level or reduce slightly as the number of young people continues to reduce. The demographics shows that the numbers continue to reduce until those currently aged 15, from when the numbers start to rise. Clearly within the sector there are some institutions which have increased their student numbers, and also there are some which have reduced their numbers. The analysis of student numbers by university segment shows this in more detail as to where student numbers have decreased or increased.

The impact of overseas students has to be recognised. Overseas students make up over 200,000 of the undergraduate population (15%) and also over 50% of the postgraduate population (170,000 out of 300,000).

4.1. SIZE OF ESTATE IN THE UK

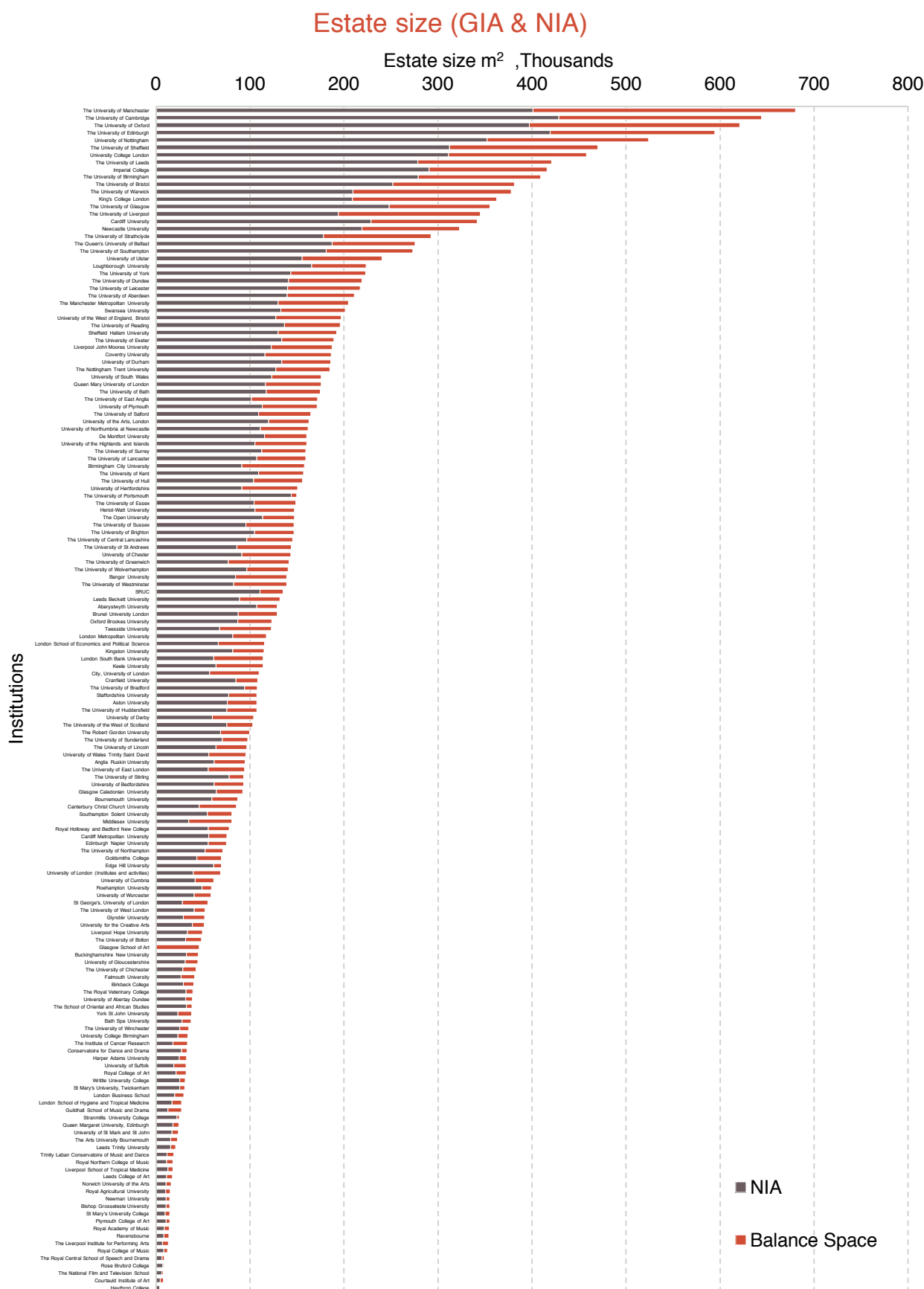


4.2. RATE OF CHANGE OF ESTATE SIZE

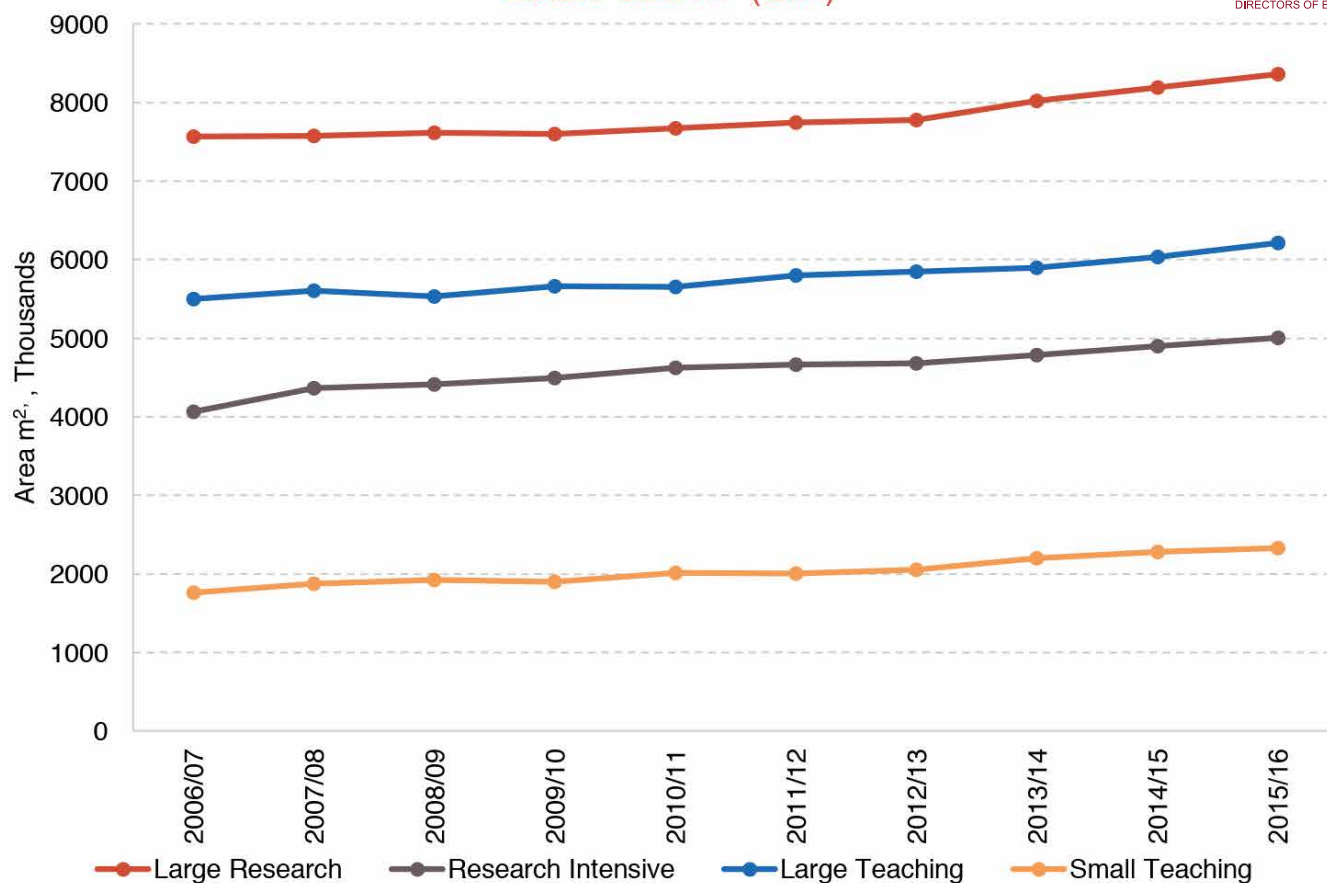


*Calculation method: $\left(\frac{\text{Non-residential NIA total (m}^2\text{)}_y - \text{Non-residential NIA total (m}^2\text{)}_{y-1}}{\text{Non-residential NIA total (m}^2\text{)}_{y-1}} \right) * 100$

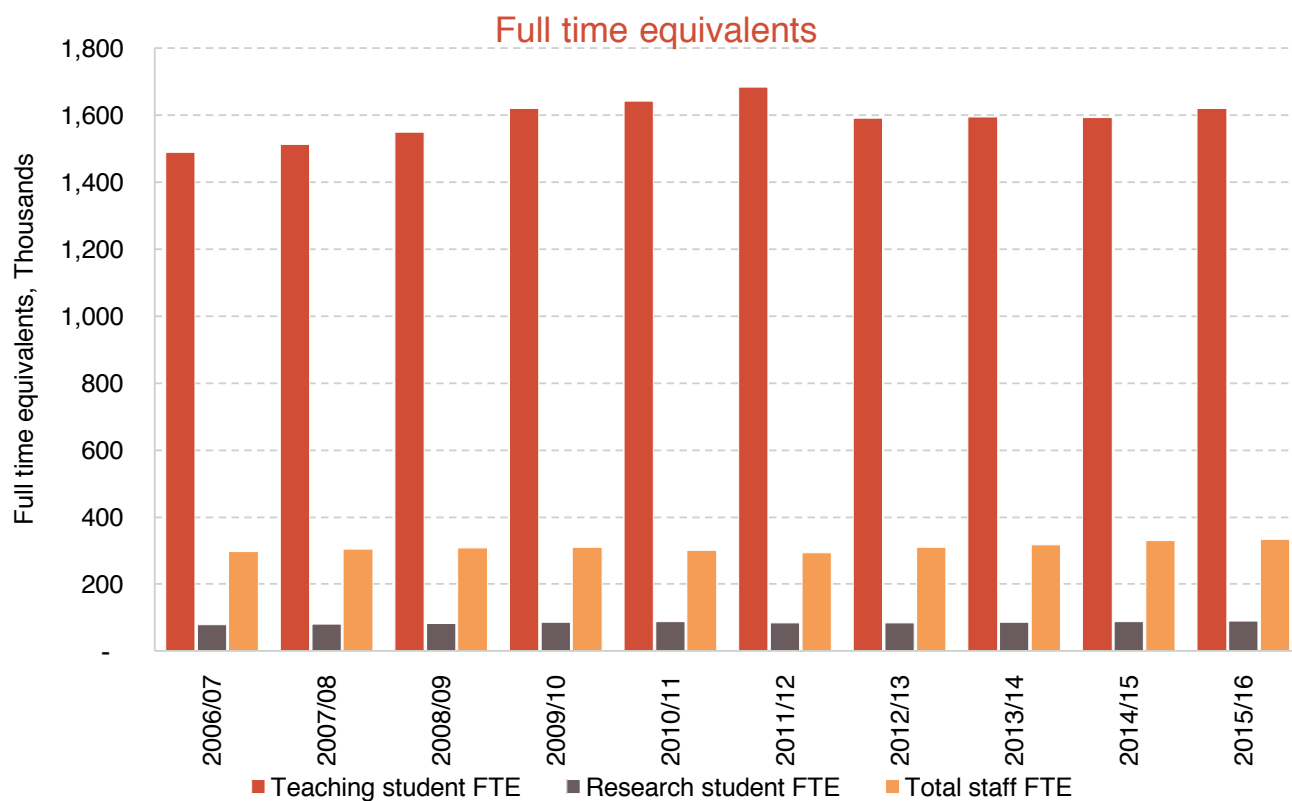
4.3. UNIVERSITY ESTATE SIZE



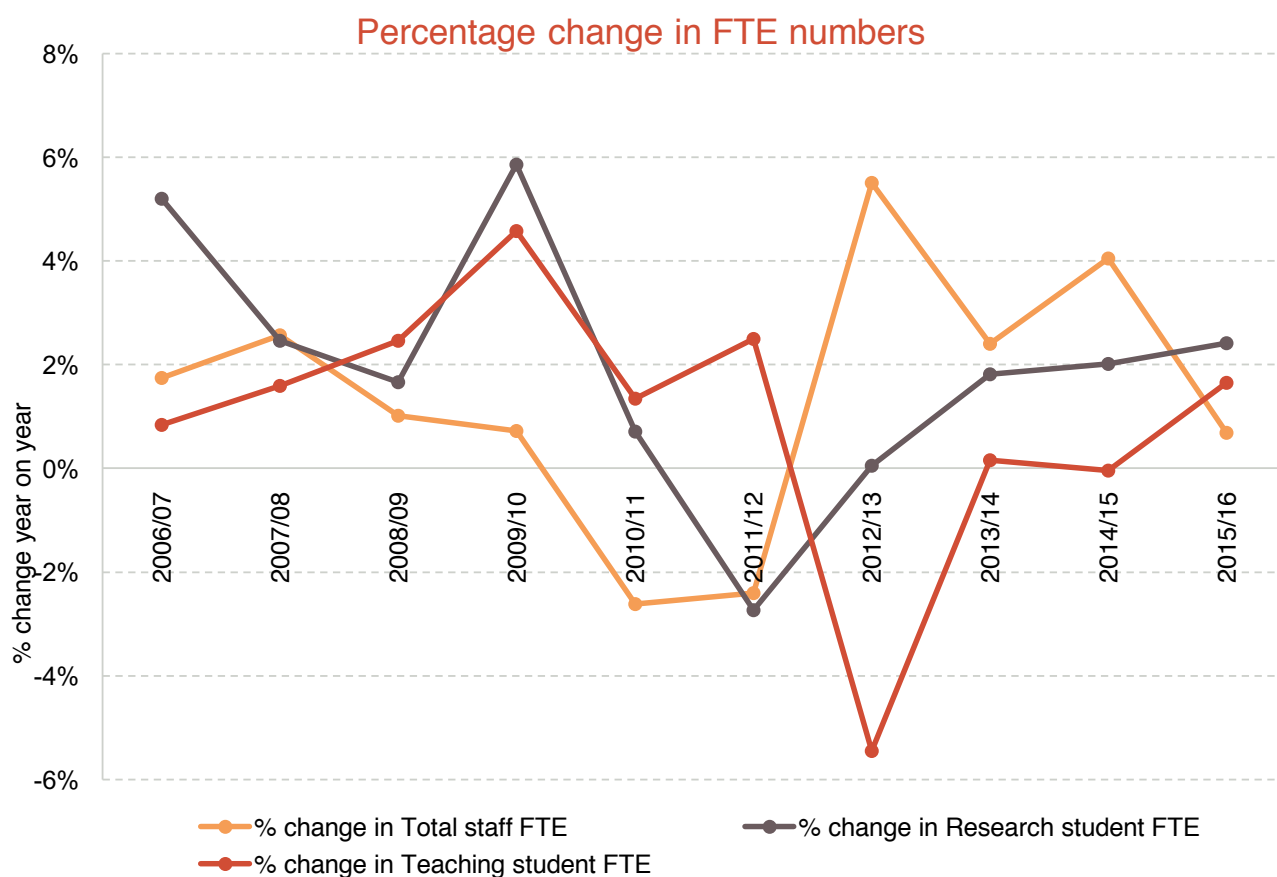
Estate size m² (GIA)



4.4. STUDENT AND STAFF NUMBERS

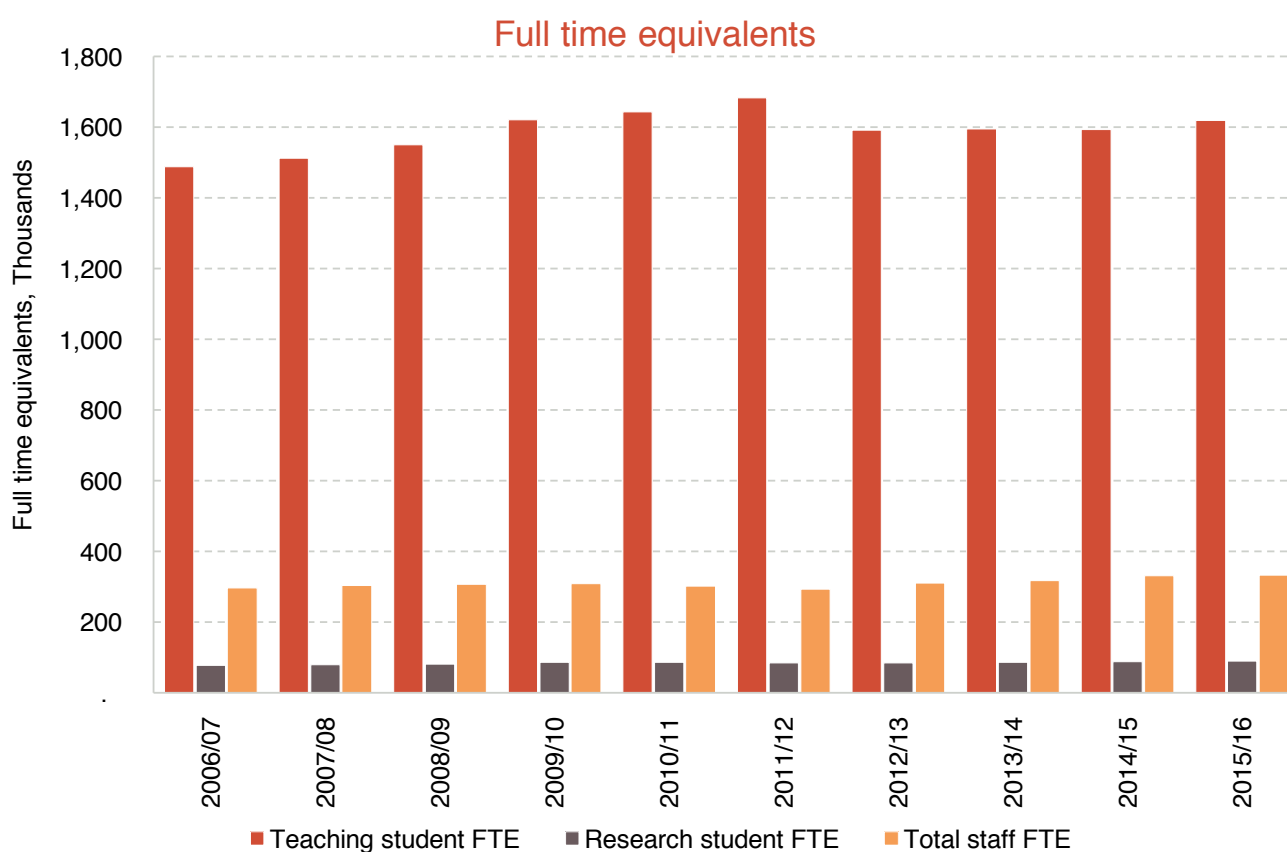


4.5. PERCENTAGE CHANGE IN FTE NUMBERS

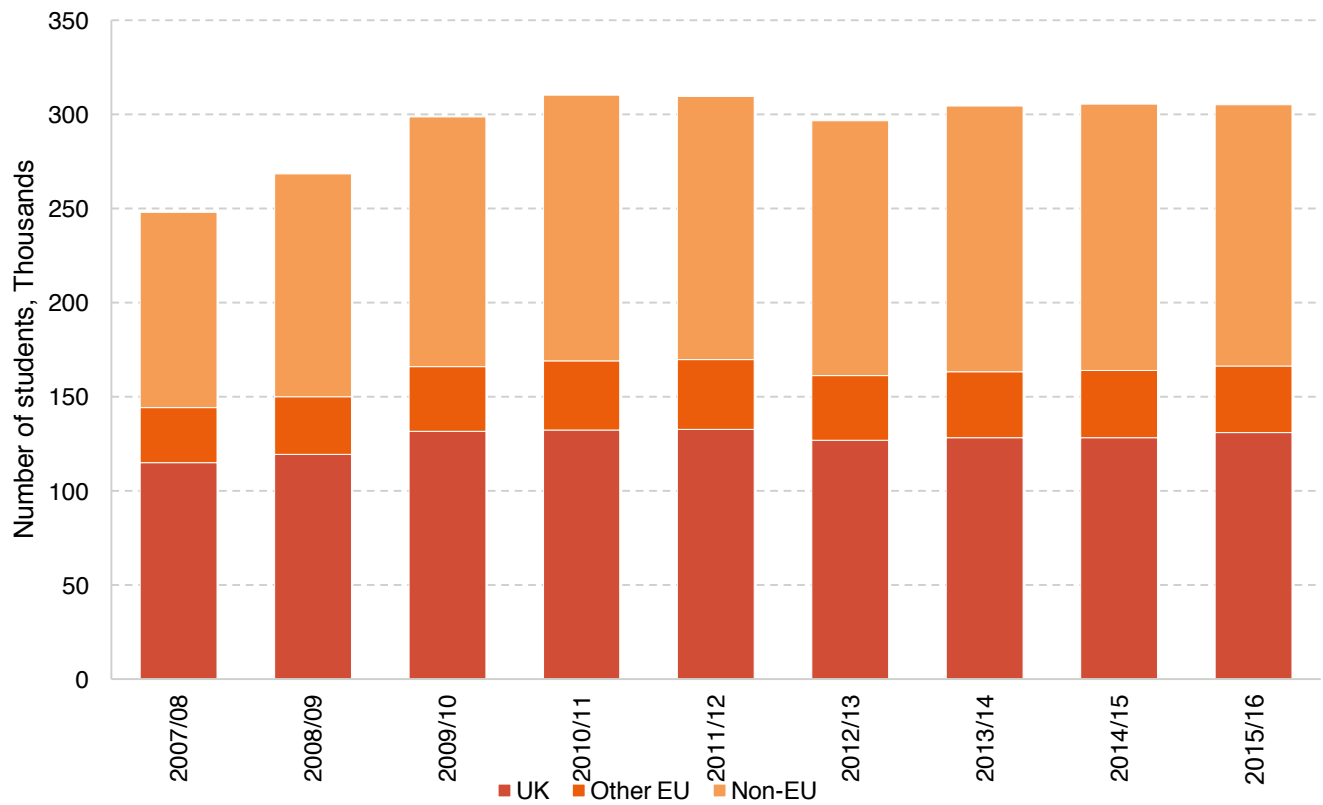


*Calculation method: $(\text{FTE numbers}_y / \text{FTE numbers}_{y-1}) * 100$

4.6. UK, EU AND NON-EU STUDENTS

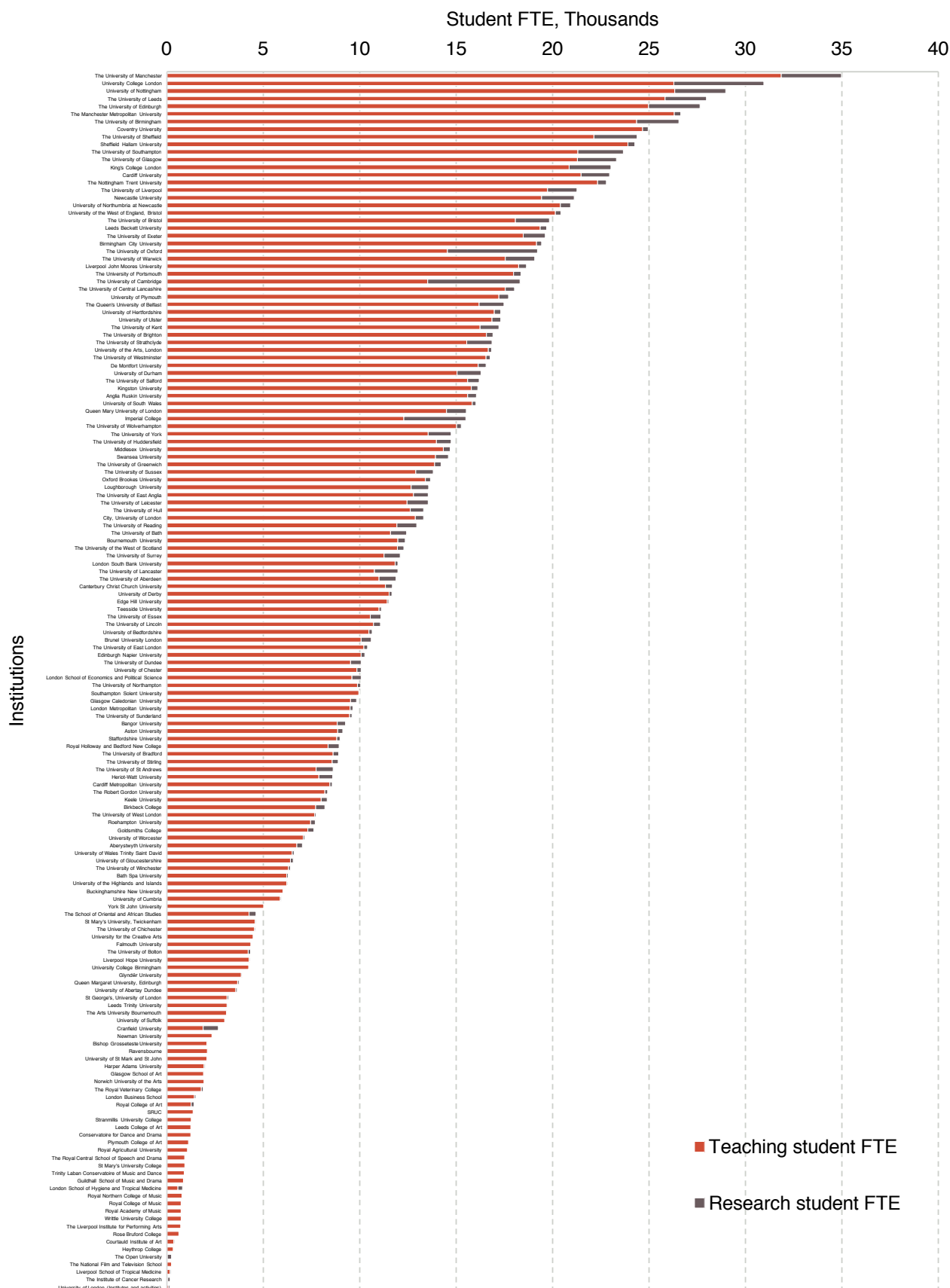


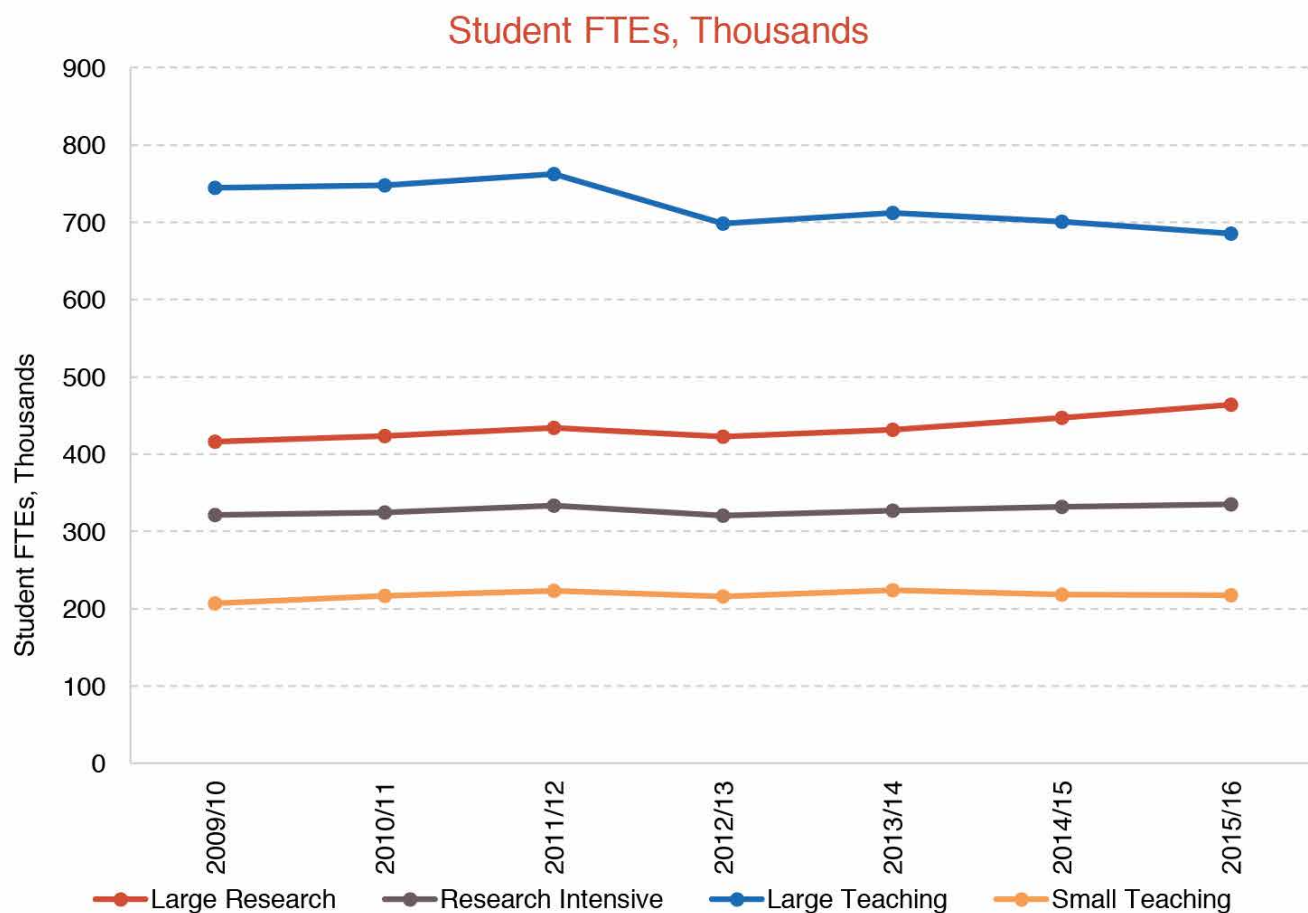
Postgraduate students by domicile marker



4.7. SIZE OF INSTITUTIONS, STUDENT FTE (TAUGHT AND RESEARCH)

Size of institutions, student FTE (Taught & Research)







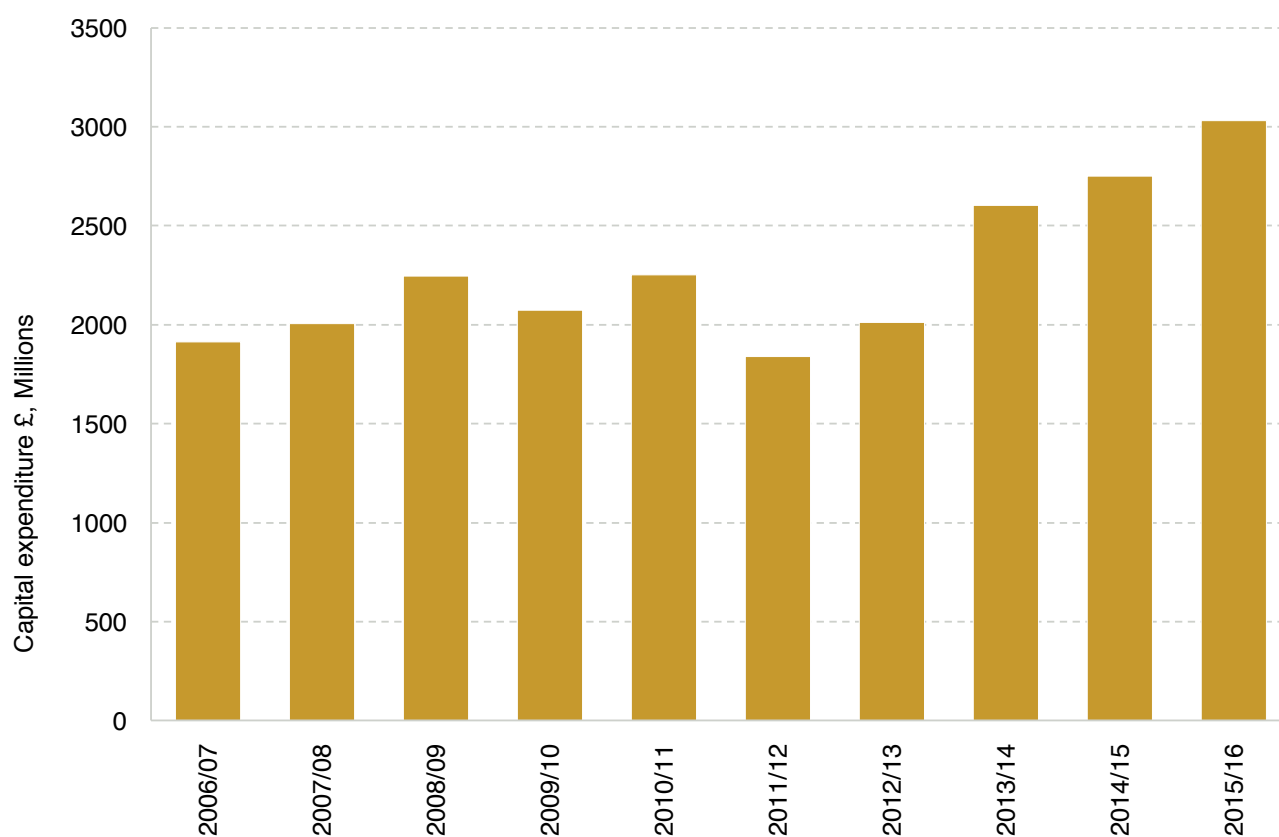
The University sector overall continues to spend substantial amounts of capital. For a period of 8 years, the sector continued to spend around £2bn per annum (from 2006/07 through to 2012/13). However, since then, capital expenditure has increased to slightly over £3bn in 2015/16. This will support both new build and extensive refurbishment projects.

Four institutions spent over £100m on capital in 2015/16, and 21 spent over £40m during the year. However, the median capital expenditure is £10m in 2015/16. This suggests, and the graph would concur, that a relatively small number of institutions are spending the very large amounts of capital, and that most institutions continue to have relatively modest capital programmes.

For the larger institution, what is now the norm is a capital programme that is planned over a significant number of years. This will include having funding in place (perhaps via some form of bond issue) and a commitment to generating a clear surplus year on year which will contribute to the capital plan. For smaller institutions, capital expenditure is more granular, with a small amount of minor capital works with more occasional larger projects.

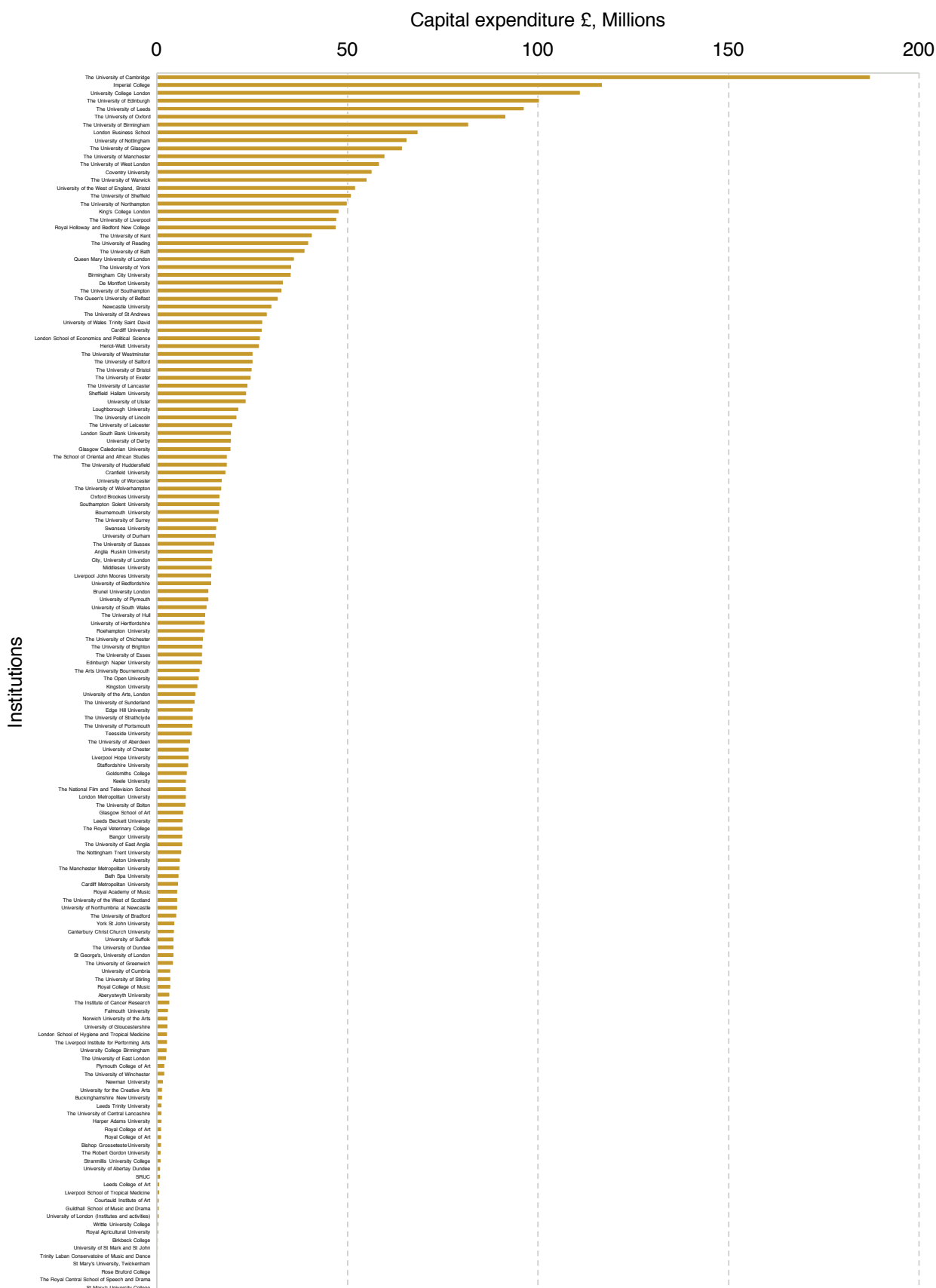
5.1. NON-RESIDENTIAL CAPITAL EXPENDITURE, BUILDINGS

Non-residential capital expenditure, buildings



5.2. TOTAL CAPITAL EXPENDITURE

Capital expenditure by institution





We have used the AUDE categories of Efficiency, Quality, Value and Sustainability for KPIs to order the metrics that we have used here. AUDE's standard recommended KPIs are included and labelled, as well as some additional metrics for more information.

AUDE has recognised that within the overall UK Higher Education sector there are very different types of institutions and that for these different institutions, a mean figure for some of these KPIs does not necessarily help to understand their performance. To help comparability between different types of institutions, AUDE has looked at developing some high-level groupings of institutions. Research, and the amount of it undertaken, is often given as a key reason for the difference in certain key aspects of estates issues, including costs, amount of space and type of space. We have used the amount of income generated by research as a key differentiator between 'research' institutions and 'teaching' institutions. We have further then differentiated these two major groupings into large and small or intensive institutions.

The graph below shows all the institutions across the UK and highlights the boundaries between the segments of institutions which are summarised as follows:

- Large Research: Over £300m income and over 20% income from research.
- Research intensive: Less than £300m income and over 20% income from research.
- Large teaching: Over £100m income and over 80% income from teaching.
- Small teaching: Less than £100m income and over 80% from teaching.



6.1. EFFICIENCY

Costs of managing the estate have remained relatively static. This has been the case for the last 7 or 8 years where costs have been held to an average of close to £90/m² across the whole estate. Fluctuations in these costs can often be attributed to spikes in energy costs either due to cost pressures or through cold winters. Of this £90/m², over £60/m² relates to costs which are dominated by salary costs (Repairs and maintenance, security, cleaning, portering and internal management costs). These will see increasing pressure following inflationary demands on salary levels. It is difficult to envisage that property costs will continue to remain level over the short to medium term.

Spatial efficiency in the University sector is very much dominated by the number of FTEs (teaching and staff), so as these numbers have increased, efficiency has improved as the increased numbers are accommodated. Student numbers have remained relatively level, and therefore we have not seen significant improvement in efficiency metrics which use student FTEs.

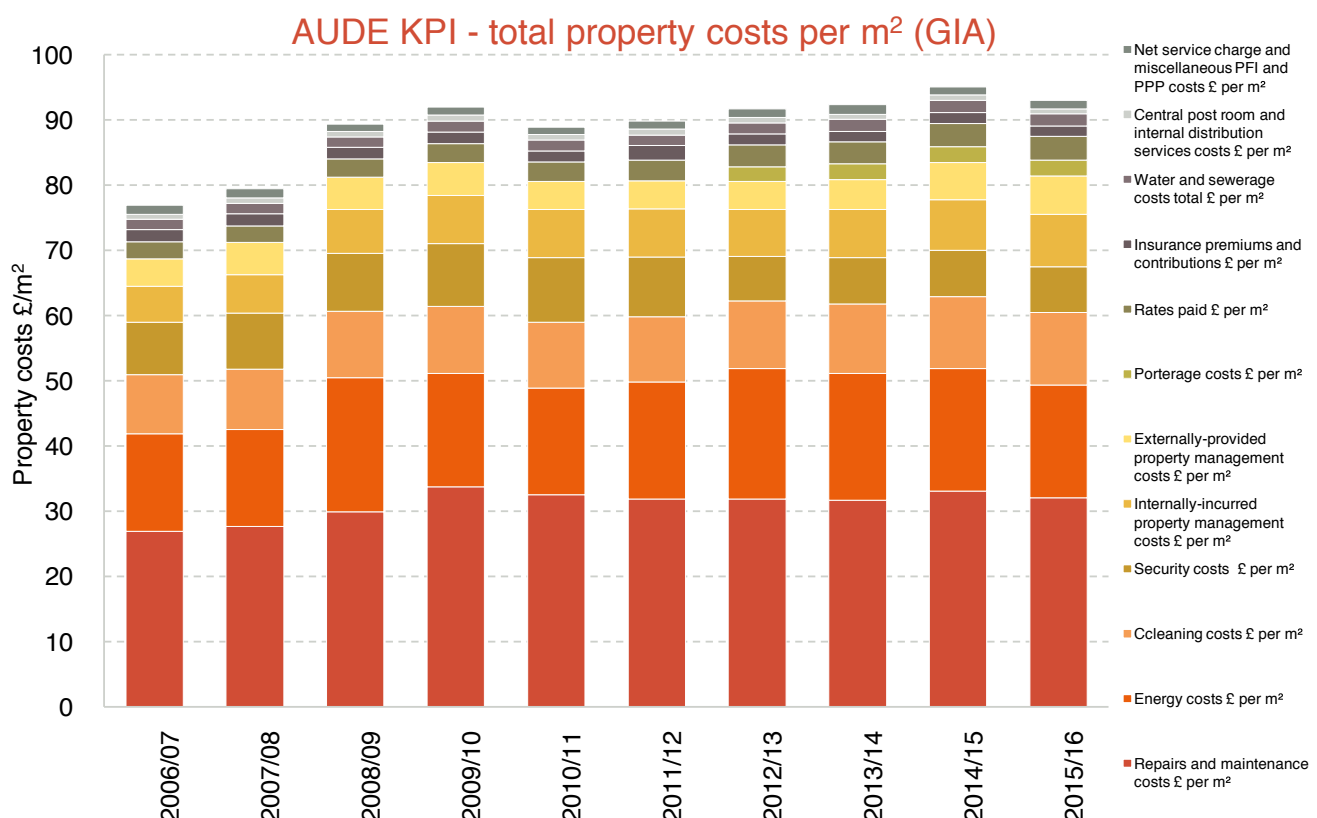
Office space continues to be an area where University use of space is different to other sectors. New more flexible office layouts are much more common in the administrative side of Universities; however, this has not apparently lead to a dramatic reduction in space per administrative FTE. Academic office space per FTE does not change rapidly, partly because of the cost and disruption modifying existing space would entail. Improvements to these figures tend to come where new space is more efficient, hence a very slow improvement trend.

The analysis by the different university segments shows that there is a difference in the total property costs between the different types of institutions. Large research institutions costing on average £103/m² whereas small teaching institutions spend £72/m². This is likely to be a reflection on the complexity of the space in these types of institutions, locations or other factor (such as being on several sites).

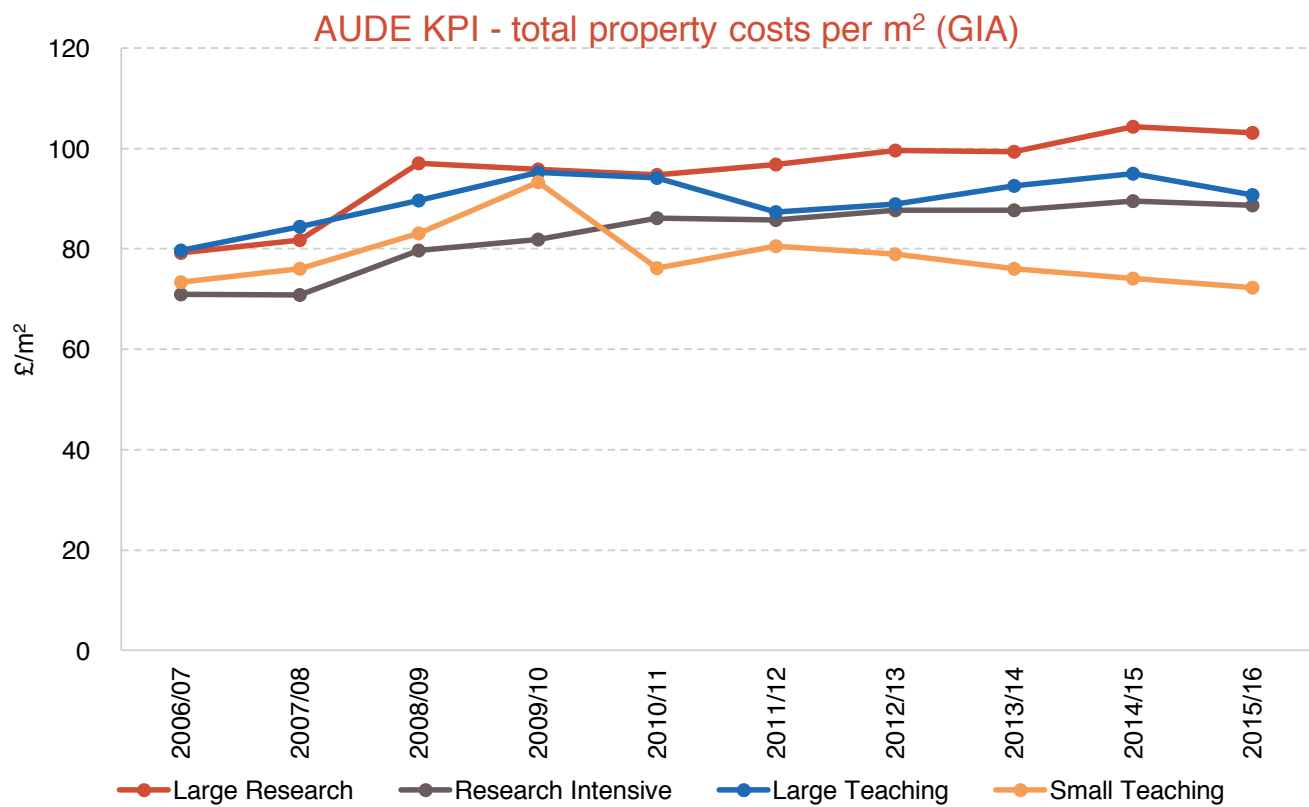
There is a wide diversion in the amount of space per FTE between the different types of institution, with the research institutions having between 15 and 18 m² per FTE and the teaching institutions between 9 and 11 m² per FTE. This is entirely a consequence of the need to provide substantial additional space as part of the research environment in the research institutions.

6.1.1. AUDE KPI TOTAL PROPERTY COSTS PER M².

6.1.1.1. TOTAL PROPERTY COSTS ALL UNIVERSITIES OVER TIME.

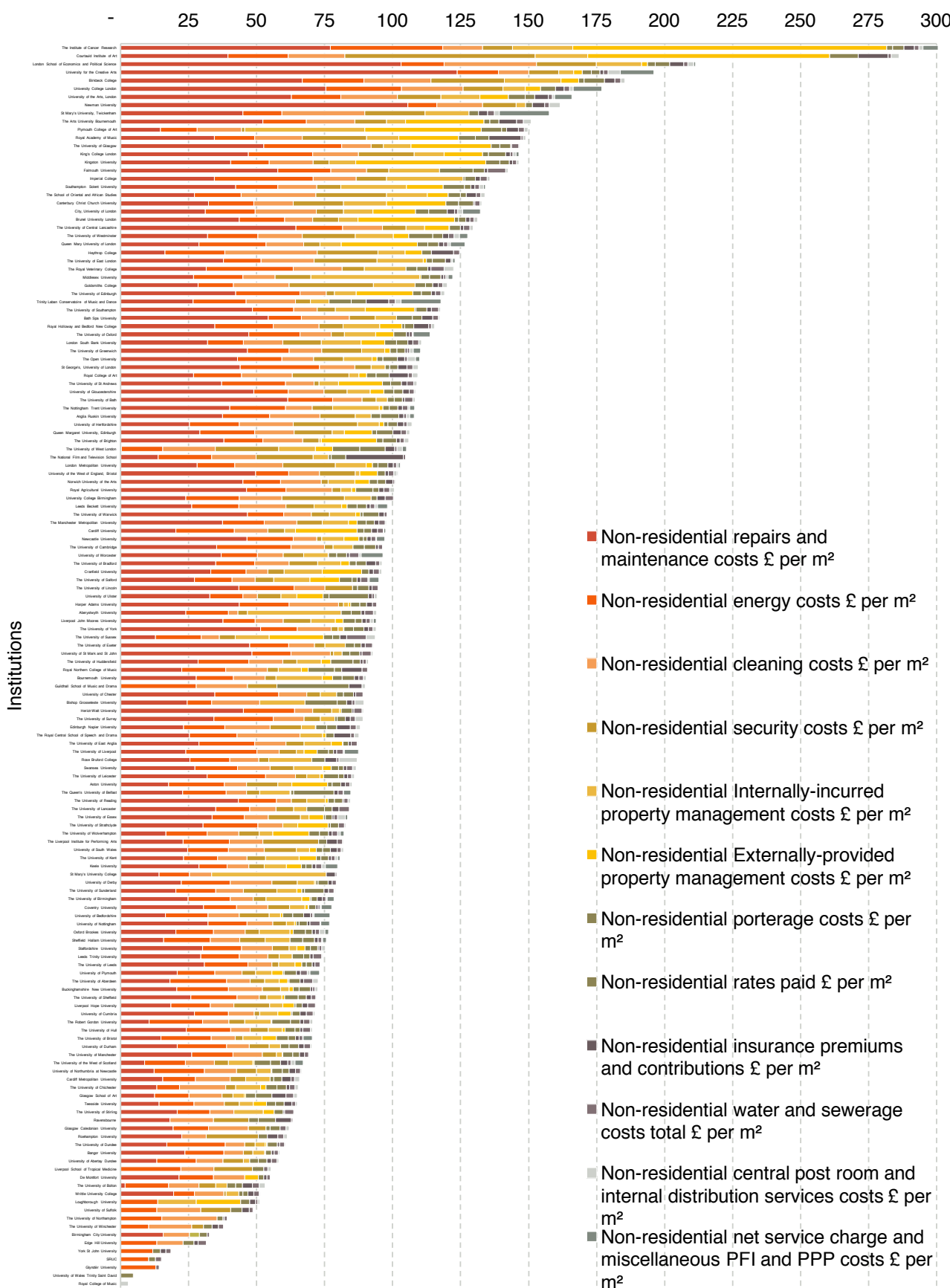


6.1.1.2. AUDE KPI – TOTAL PROPERTY COST PER M² (GIA) BY SEGMENT

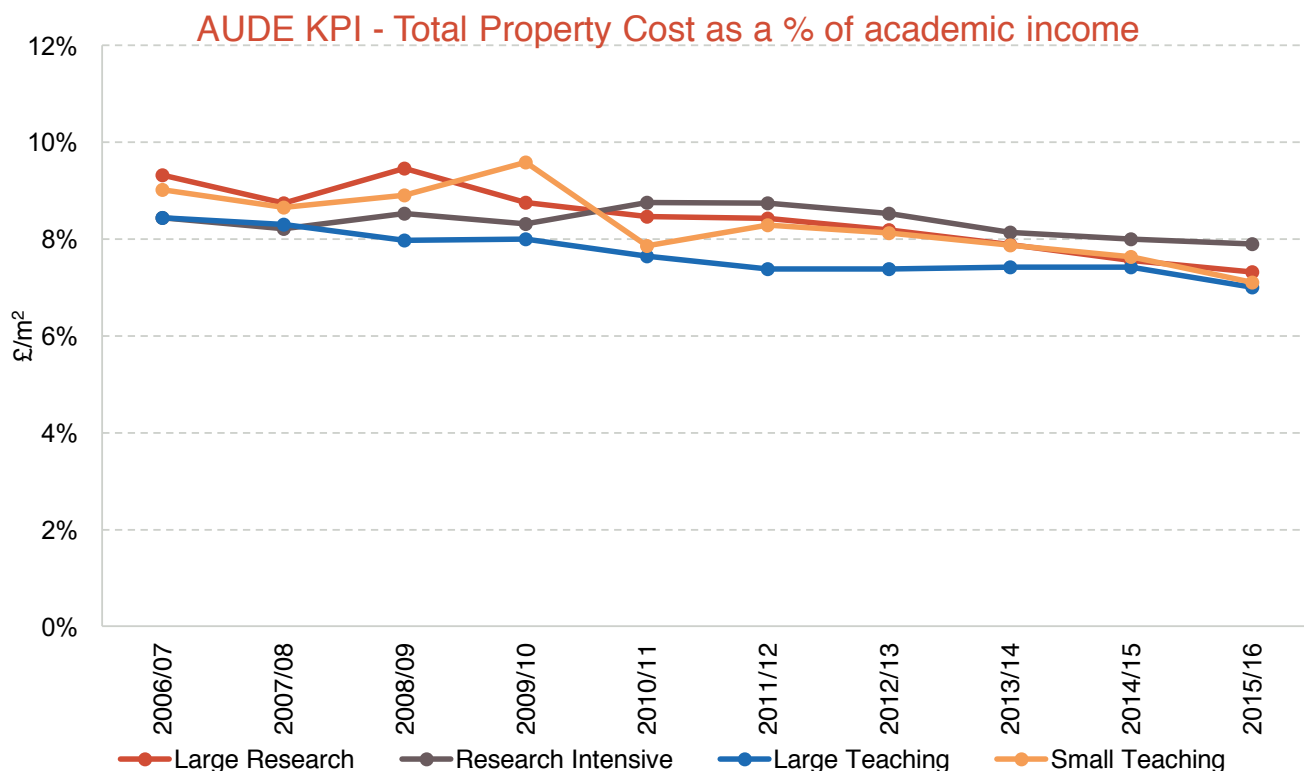


6.1.1.3. AUDE KPI – TOTAL PROPERTY COST PER M² (GIA) ALL INSTITUTIONS

Total property cost £/m² for all institutions £ per m² (GIA)

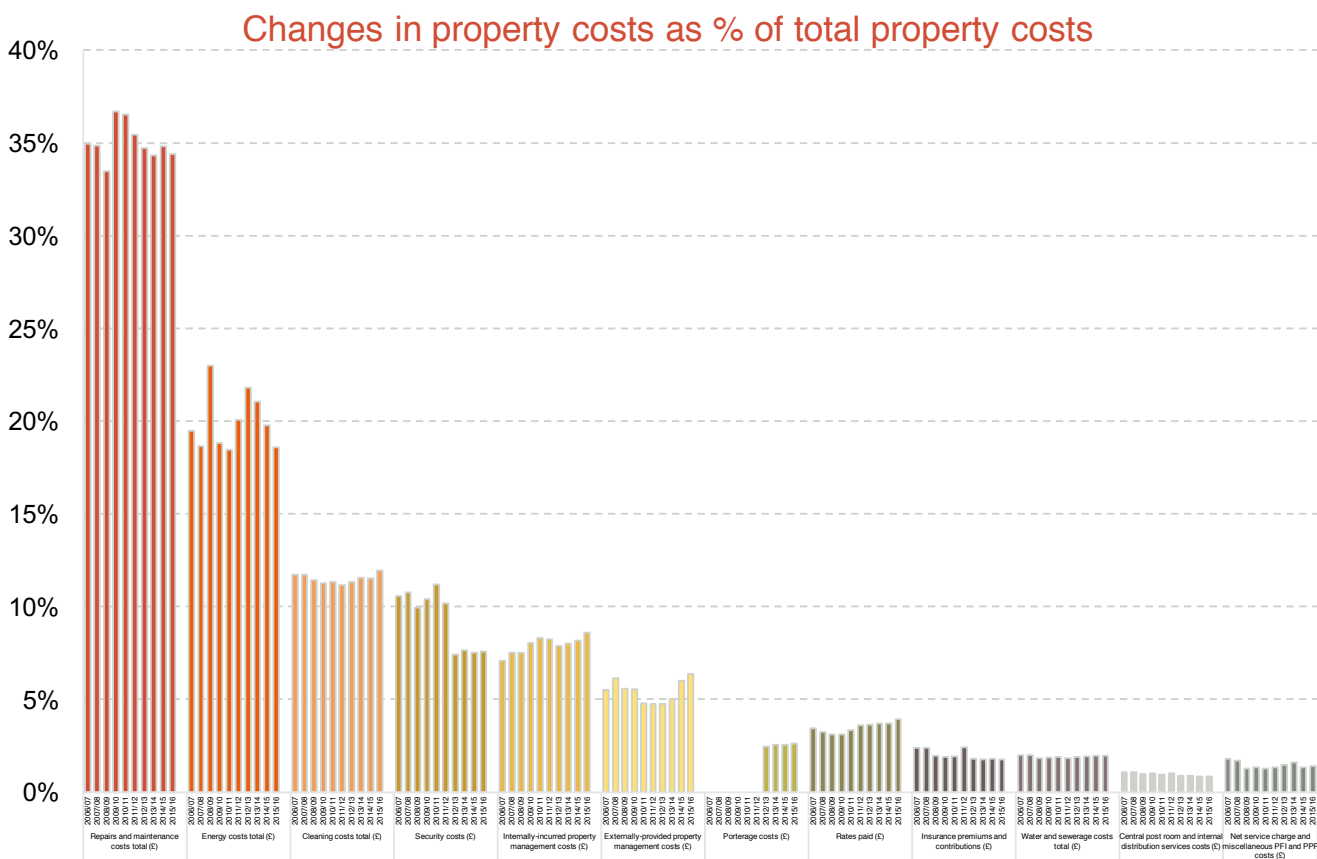


6.1.2. TOTAL PROPERTY COSTS AS A PERCENTAGE OF ACADEMIC INCOME BY SEGMENT



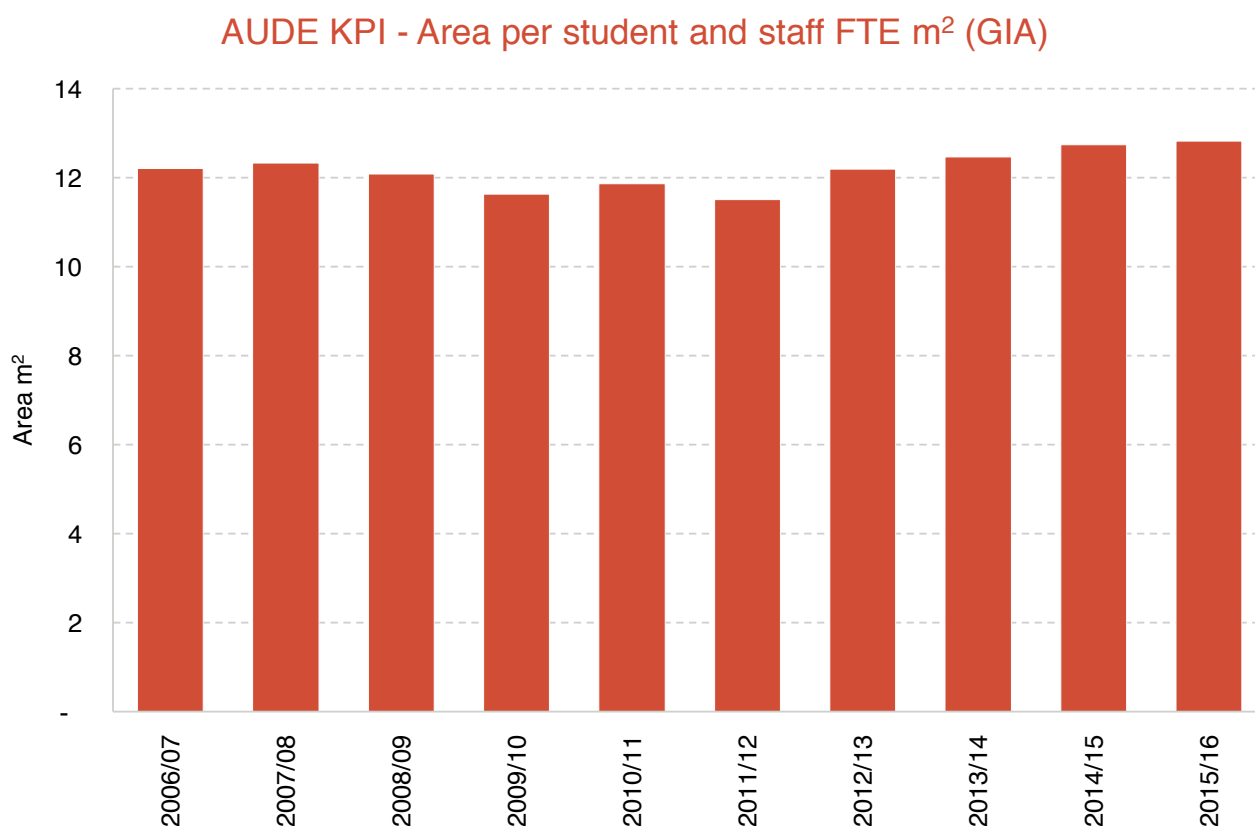
*Calculation method: Total Property Cost (£)_y / Academic Income (£)_y

6.1.3. CHANGES IN PROPERTY COSTS AS % TPC



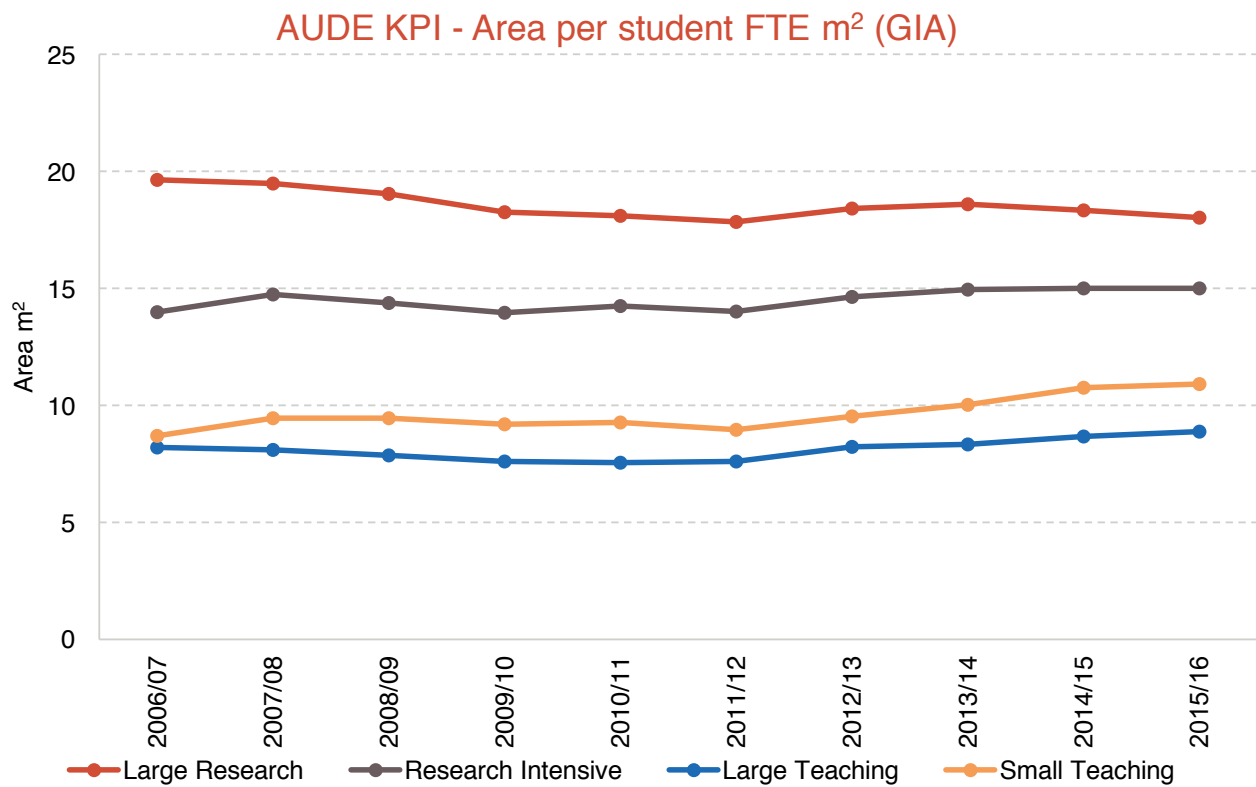
6.1.4. AUDE KPI AREA PER STUDENT AND STAFF FTE M² (GIA)

6.1.4.1. AREA PER STUDENT AND STAFF FTE M² ALL INSTITUTIONS OVER TIME



*Calculation method: Non-residential GIA (m²)_y / (Total student FTE_y + Total teaching & Research staff FTE_y)

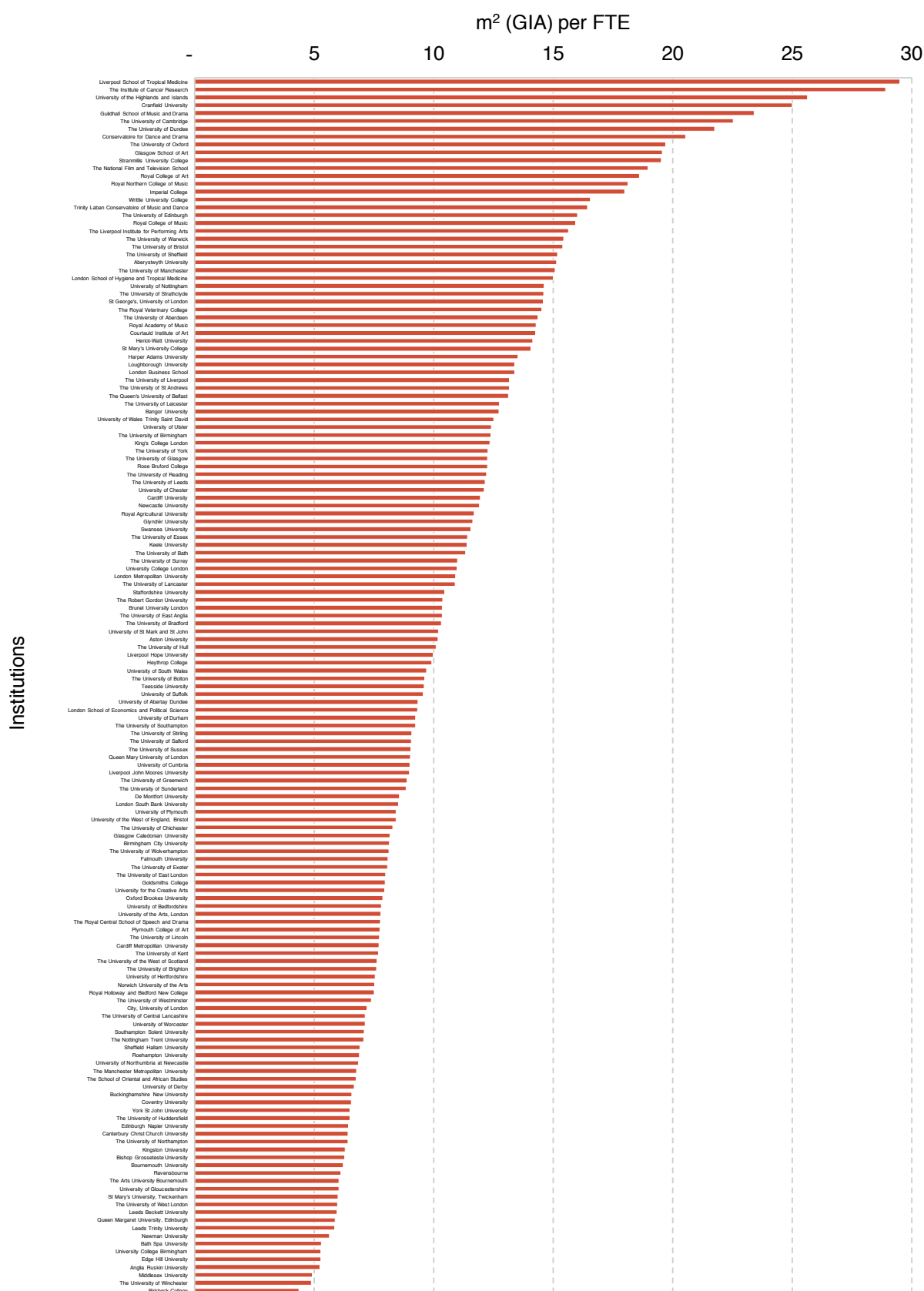
6.1.4.2. AREA PER STUDENT AND STAFF FTE BY SEGMENT



*Calculation method: Non-residential GIA (m²)_y / (Teaching student FTE_y + Research student FTE_y)

6.1.4.3. AREA PER STUDENT AND STAFF FTE ALL INSTITUTIONS

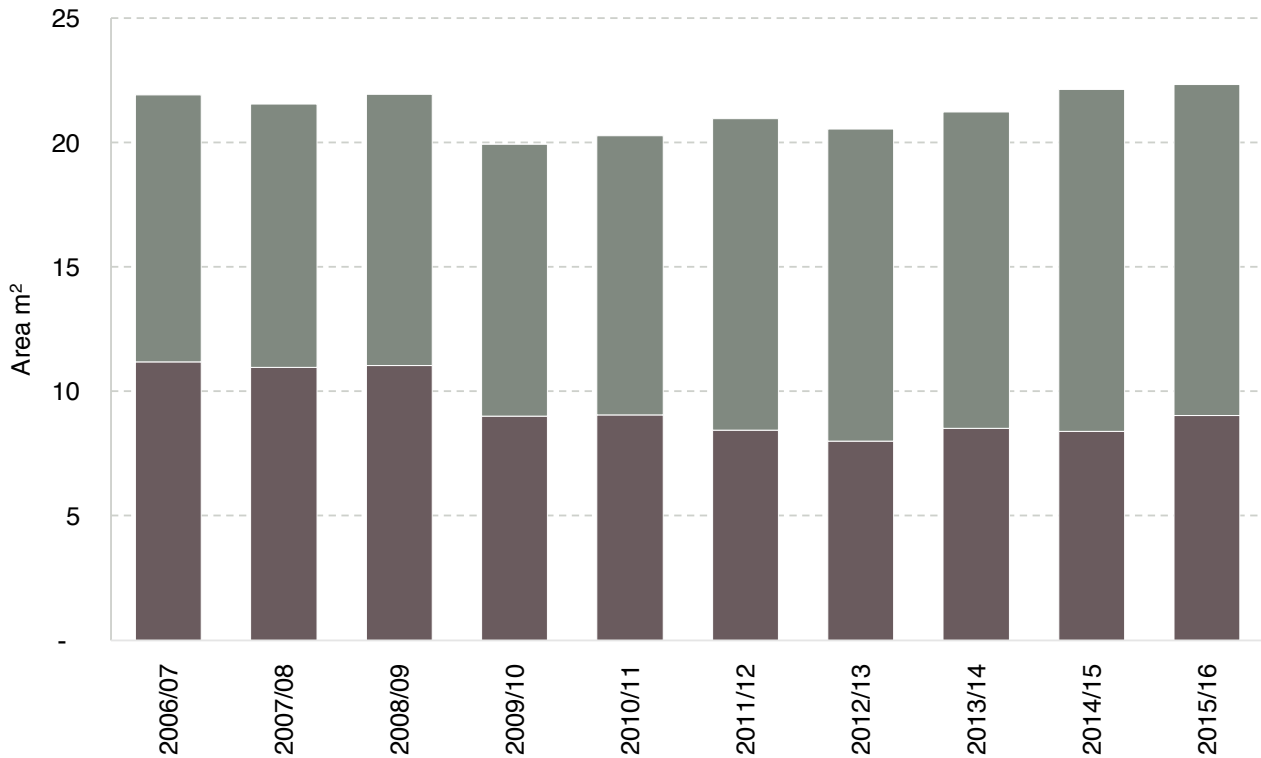
AUDE KPI - Area per student and staff FTE, all institutions



*Calculation method: Non-residential GIA (m²) ÷ (Total student FTE ÷ Total teaching & research staff FTE ÷ i) (i.e. Non-residential GIA (m²) ÷ i - Non-residential GIA (m²) for i institution)

6.1.5. RESEARCH SPACE BY RESEARCH FTE

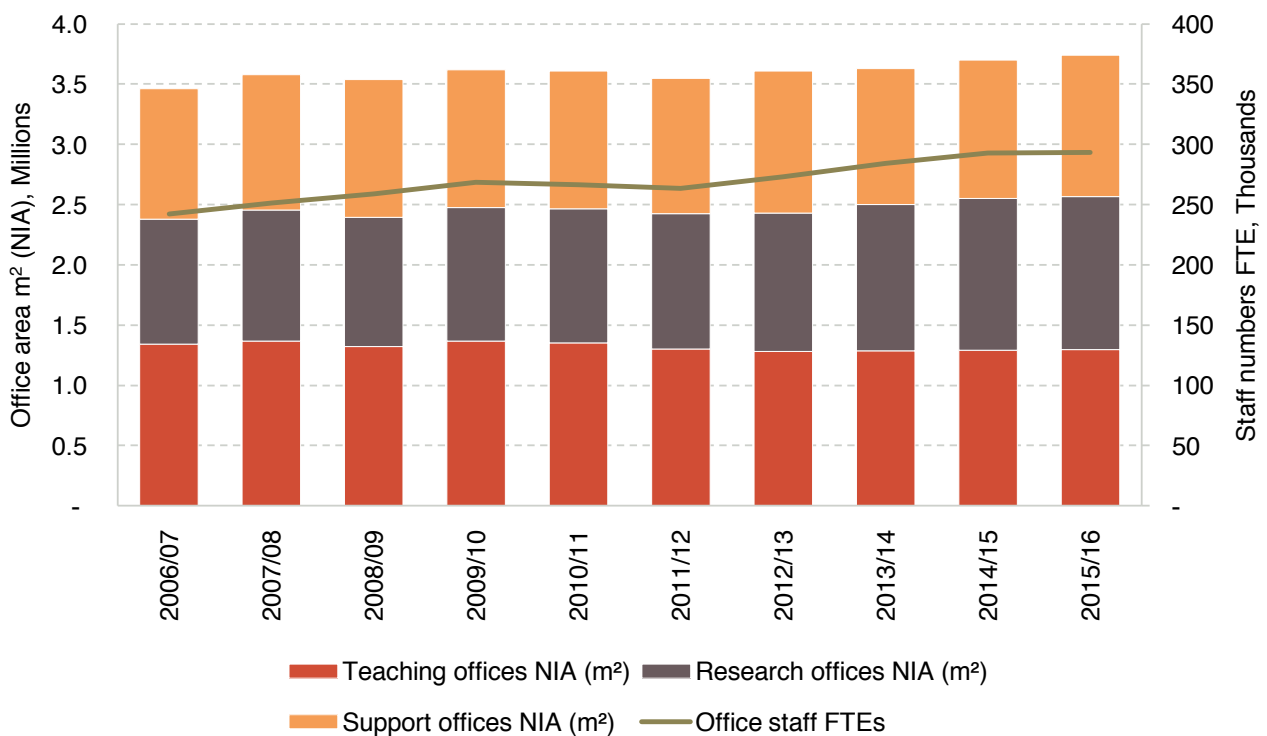
Research space per research student



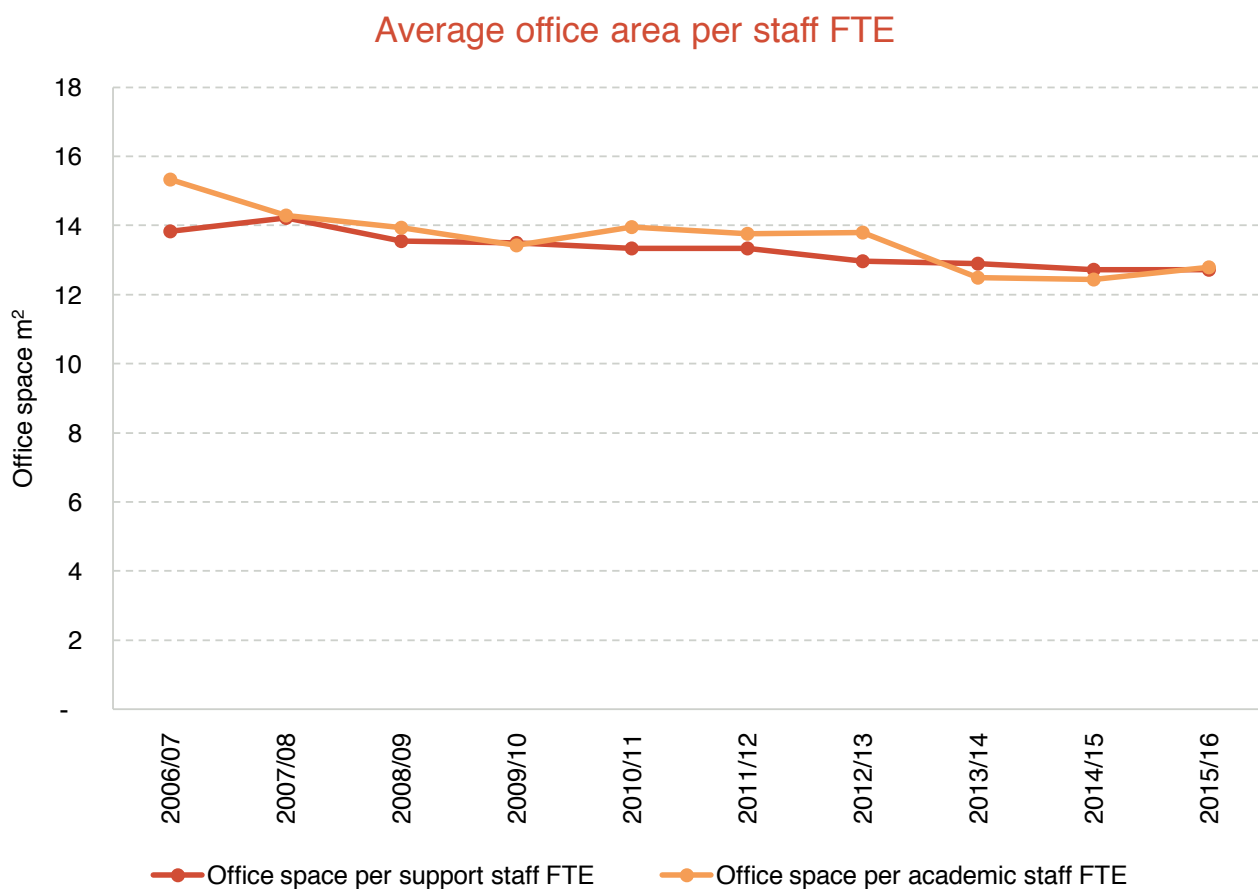
*Calculation method: 1. $(\text{Research not offices NIA (m}^2\text{)} - \text{Research not offices specialist academic area (m}^2\text{)}) / \text{Research student FTE}_y$
2. $\text{Research not offices specialist academic area (m}^2\text{)} / \text{Research student FTE}_y$

6.1.6. OFFICE SPACE BY TYPE OF STAFF

Office space by type of staff

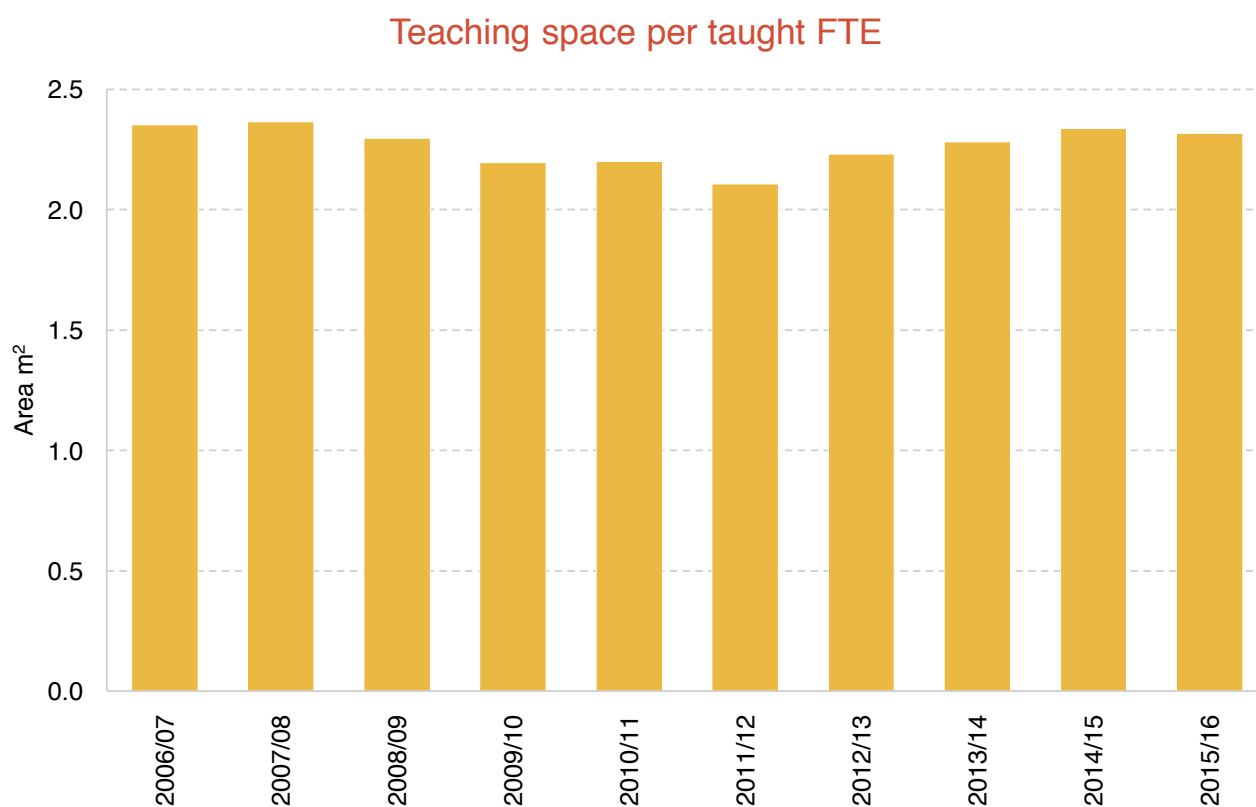


6.1.7. AVERAGE OFFICE AREA PER FTE



*Calculation method: 1. Support offices NIA (m²)_y / Support offices staff FTE_y 2. (Teaching offices NIA (m²)_y + Research offices NIA (m²)_y) / Teaching & Research staff FTE_y

6.1.8. TEACHING SPACE PER TAUGHT FTE



*Calculation method: Teaching not offices NIA (m²)_y / Teaching student FTE_y

6.2. QUALITY

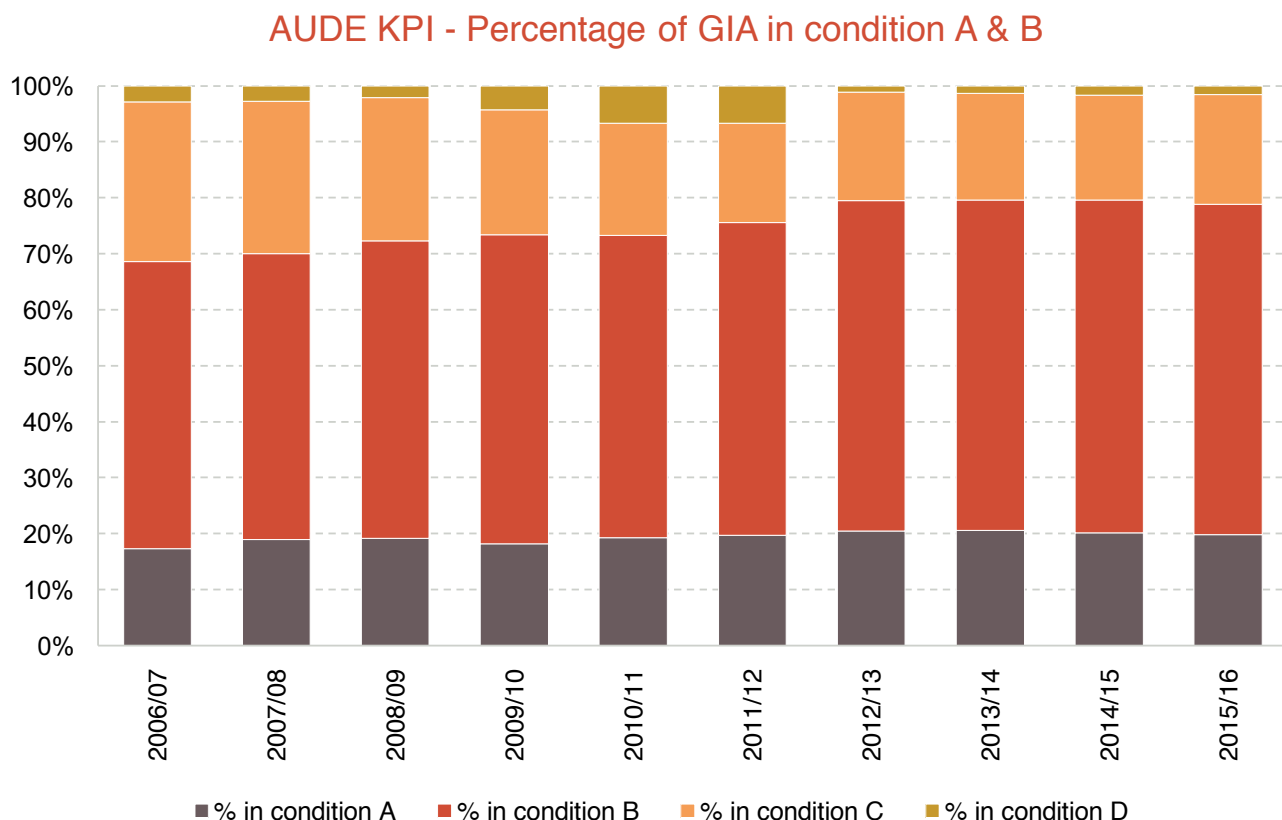
The improving quality of the University estate has appeared to have reached a plateau, with the percentage of the estate in condition C and D remaining at about 20% for the last 4 years. Given the sustained investment that is being made, there is clearly an improvement being made to the estate. One hypothesis is that as new space is completed, (condition A, functional suitability 1) there is a similar amount of estate which is being slowly downgraded from the higher classifications to those slightly lower down. Condition A is defined as 'as new', so estate must become condition B after several years. It is likely then that this represents an equilibrium with new better condition and suitable accommodation being completed and causing estate to be re-classified as a lower category as it ages.

The cost to upgrade the estate (from C and D to B) remains at about 17%. This suggests that as income increases, the costs are also rising (probably in line with inflation as costs increase) and would suggest that there is likely always to be an element of backlog of work requiring refurbishment.

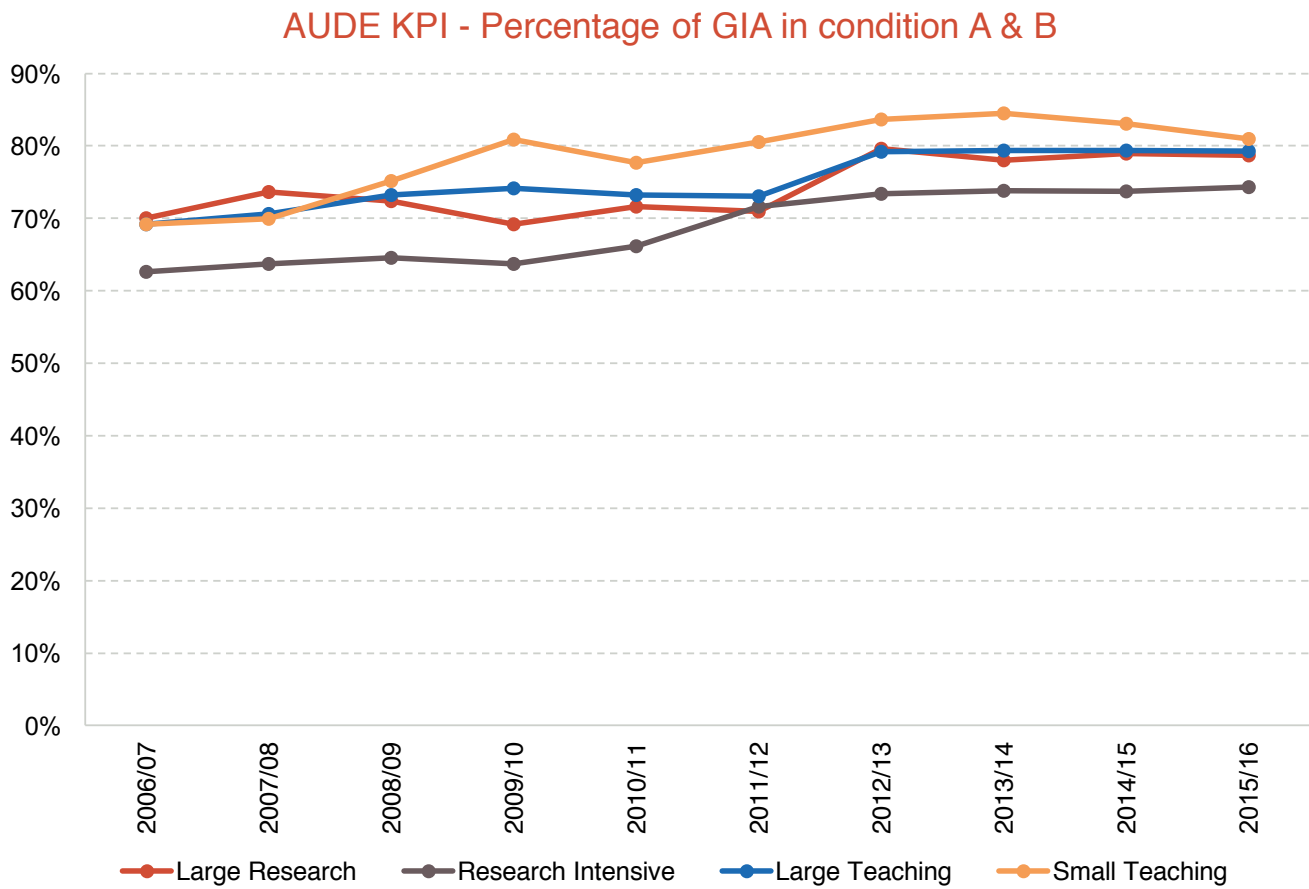
What is evident from the age chart (and clearly a matter of fact) is that the percentage of younger estate increases, with now over a quarter (26%) of the estate built since 2016. One note of caution, one third of the estate is built between 1960 and 1979, this is likely to be getting near to its design life and is bound to be exhibiting some challenges to estates departments. Also, some of the buildings built in the 1980s were built to a lower specification than might be the case today (mainly due to a very much more restricted funding environment).

6.2.1. AUDE KPI PERCENTAGE OF GIA IN CONDITION A AND B

6.2.1.1. PERCENTAGE OF GIA IN CONDITION A AND B, WHOLE SECTOR OVER TIME.

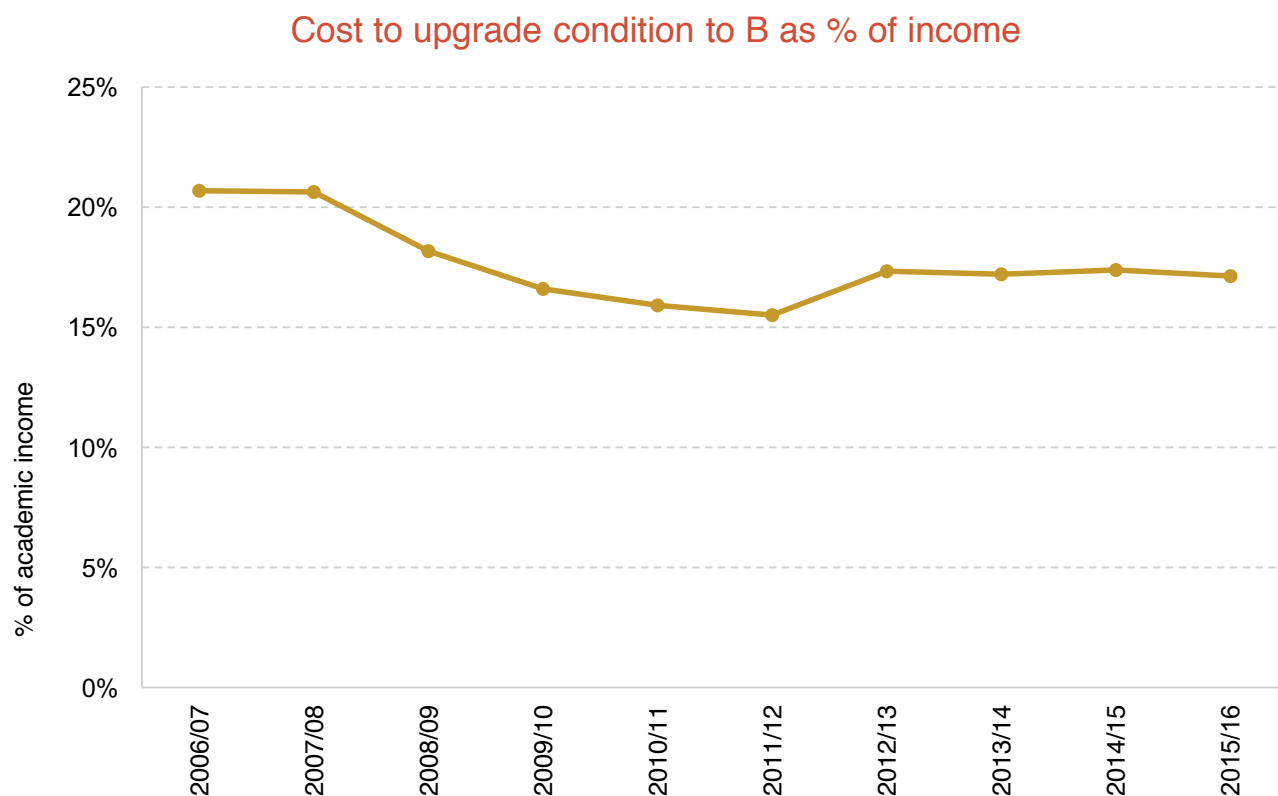


6.2.1.2. PERCENTAGE OF GIA IN CONDITION A AND B, BY SEGMENT



*Calculation method: (e.g. Non-residential building assessment condition A (%) + (Non-residential building assessment condition B (%))

6.2.2. COST TO UPGRADE TO B AS % OF INCOME

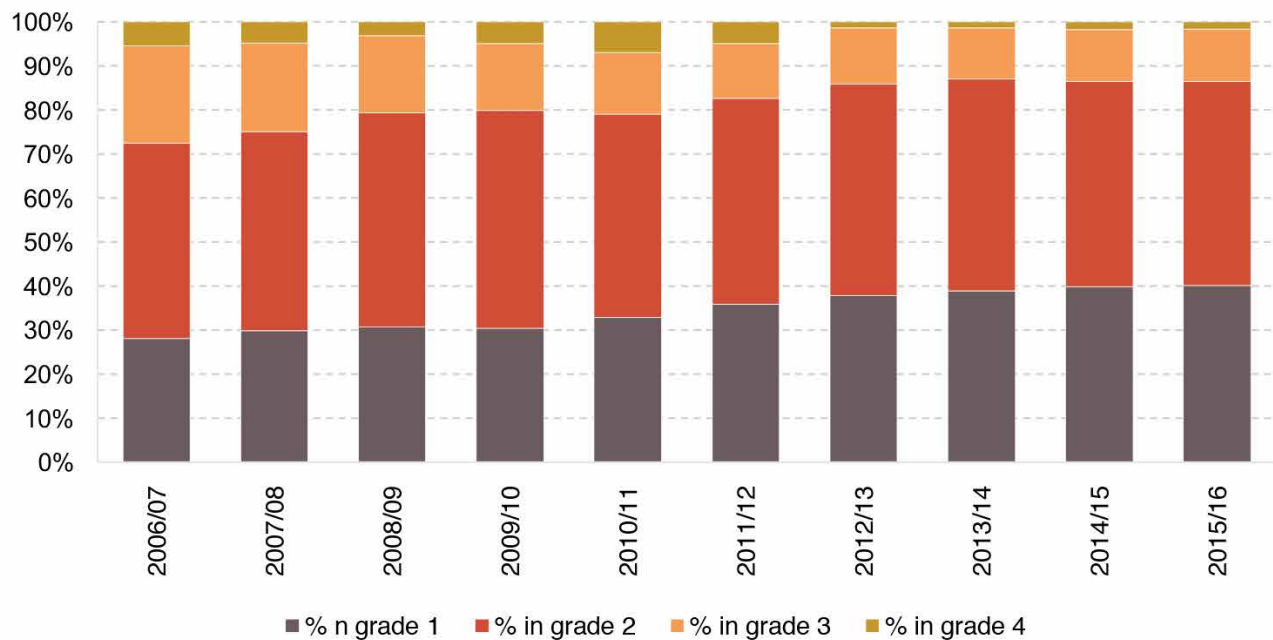


*Calculation method: Cost to upgrade condition C & D to B_y / Academic Income (£)_y

6.2.3. AUDE KPI PERCENTAGE OF GIA IN FUNCTIONAL SUITABILITY GRADES 1 AND 2

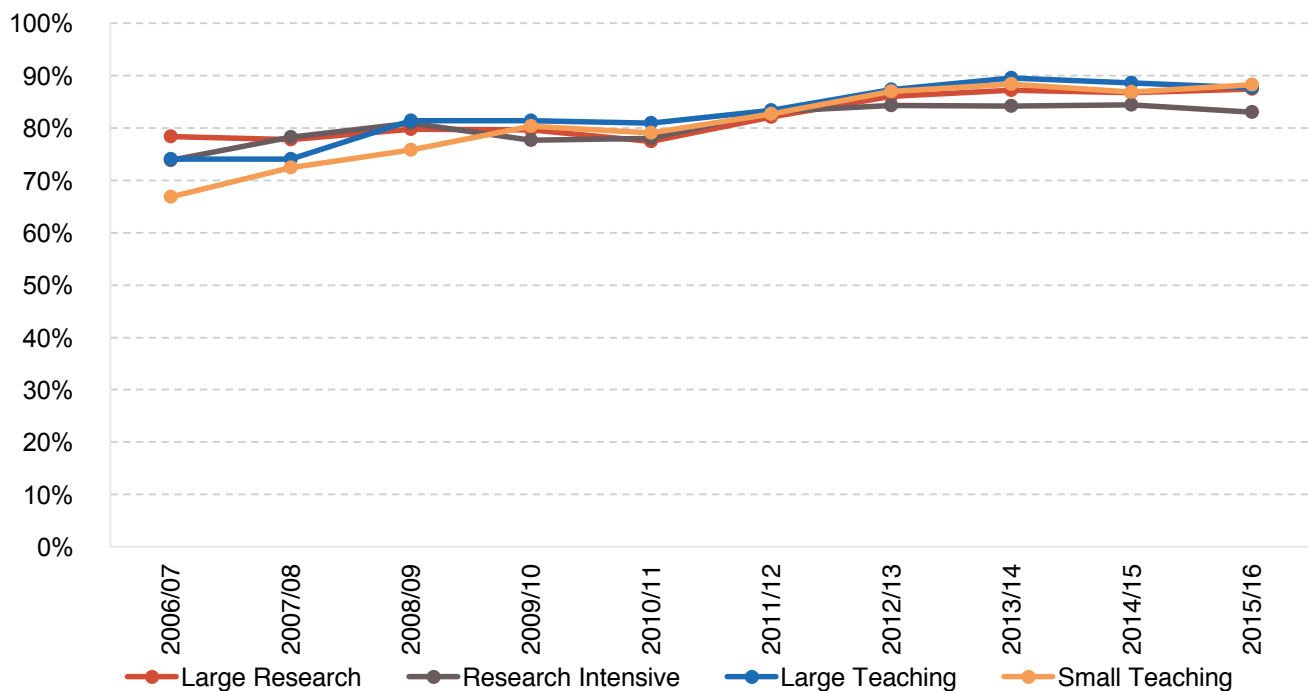
6.2.3.1. PERCENTAGE OF GIA IN FUNCTIONAL SUITABILITY GRADES 1 AND 2, WHOLE SECTOR OVER TIME

AUDE KPI - Percentage of GIA in functional suitability grades 1 & 2



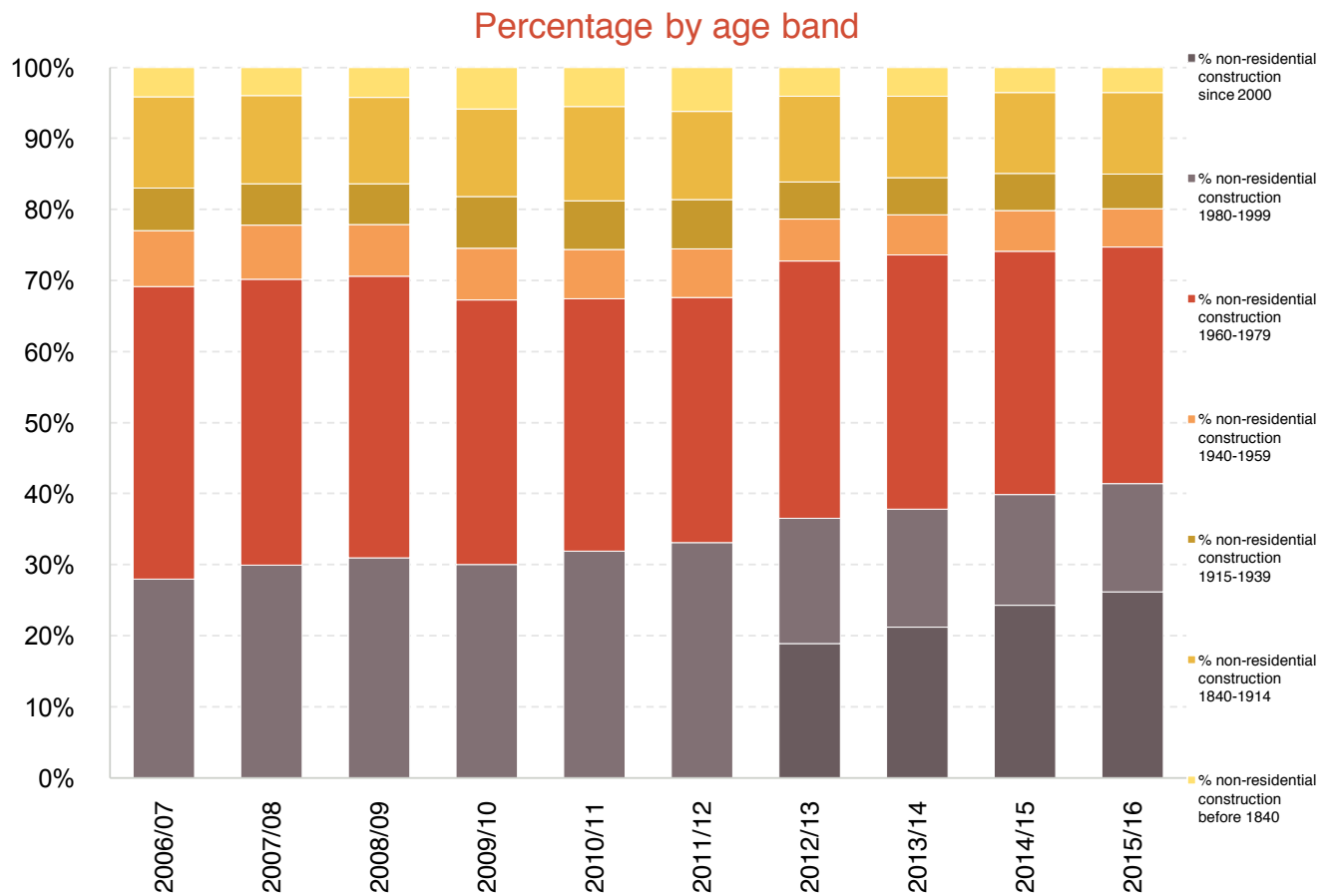
6.2.3.2. PERCENTAGE OF GIA IN FUNCTIONAL SUITABILITY GRADES 1 & 2 BY SEGMENT

AUDE KPI - Percentage of GIA in functional suitability grades 1 & 2



Calculation method: Non-residential functional suitability grade 1 (%) + Non-residential functional suitability grade 2 (%)

6.2.4. PERCENTAGE OF ESTATE BY AGE BANDS



6.3. VALUE

The size of the estate (across all institutions) continues to grow, however income also continues to grow at a faster rate than the size of the estate. Growth in income has come from increasing teaching income, although across the sector research income has remained level. (NB, 'other' income is not included within these metrics).

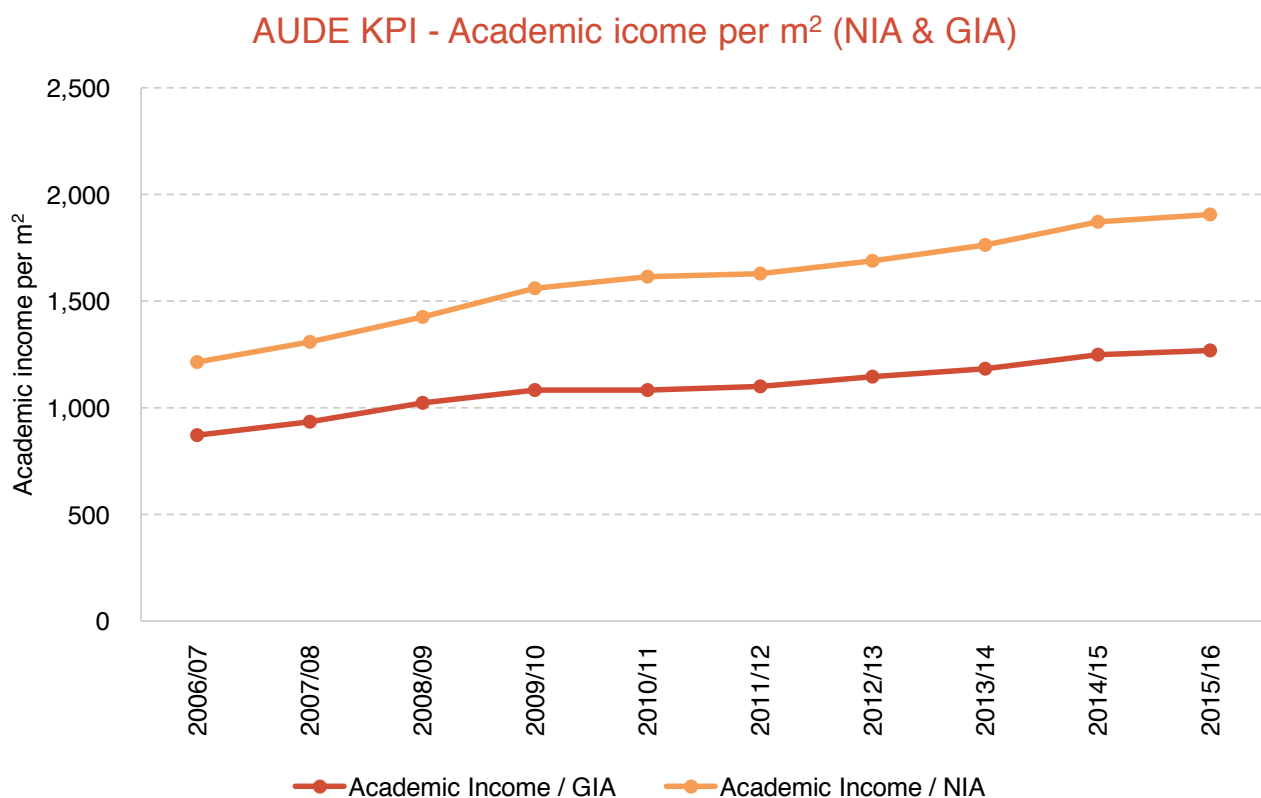
There are a handful of institutions which generate over £3,000 per m². These tend to be specialist research institutions, or are located in London, or both. Over 60% of institutions generate between £1,500 and 2,500 per m². Generating a higher income per m² indicates that the estate is more efficiently used, and can help to reduce the % of income spent on property whilst increasing the amount that an institution can spend per m². Smaller institutions (both teaching and research institutions) appear to generate a lower income per m² than the larger institutions due to some inefficiencies of scale. Large research institutions generate the highest income per m² at £2,100 per m². This presumably reflects the fact that research space generates greater income per m², and hence large research institutions generate a greater income per m² overall.

What is particularly notable is that teaching income per m² of teaching space continues to grow, whilst research income per m² has remained level. This is due to the overall income generated by teaching continuing to rise whilst research income has stalled. It also has to be matched by an increasing utilisation of teaching space.

Insurance Replacement Value is used in these statistics as a replacement for value of estate. Typically IRV is calculated by using a cost per m² basis, and represents a reasonable assumption about the total monetary size of the estate. As a proportion of income, it remains at roughly 250% (i.e. 2.5 times larger). This suggests that academic income is 40% of the 'value' of the estate. It appears that research institutions (large and specialist) achieve a ratio of 267% (i.e. a return of 37%) whereas large teaching institutions generate a figure of 200% (i.e. a return of 50%) and small teaching institutions of 300% (a return of 33%).

6.3.1. AUDE KPI INCOME PER M² (GIA AND NIA)

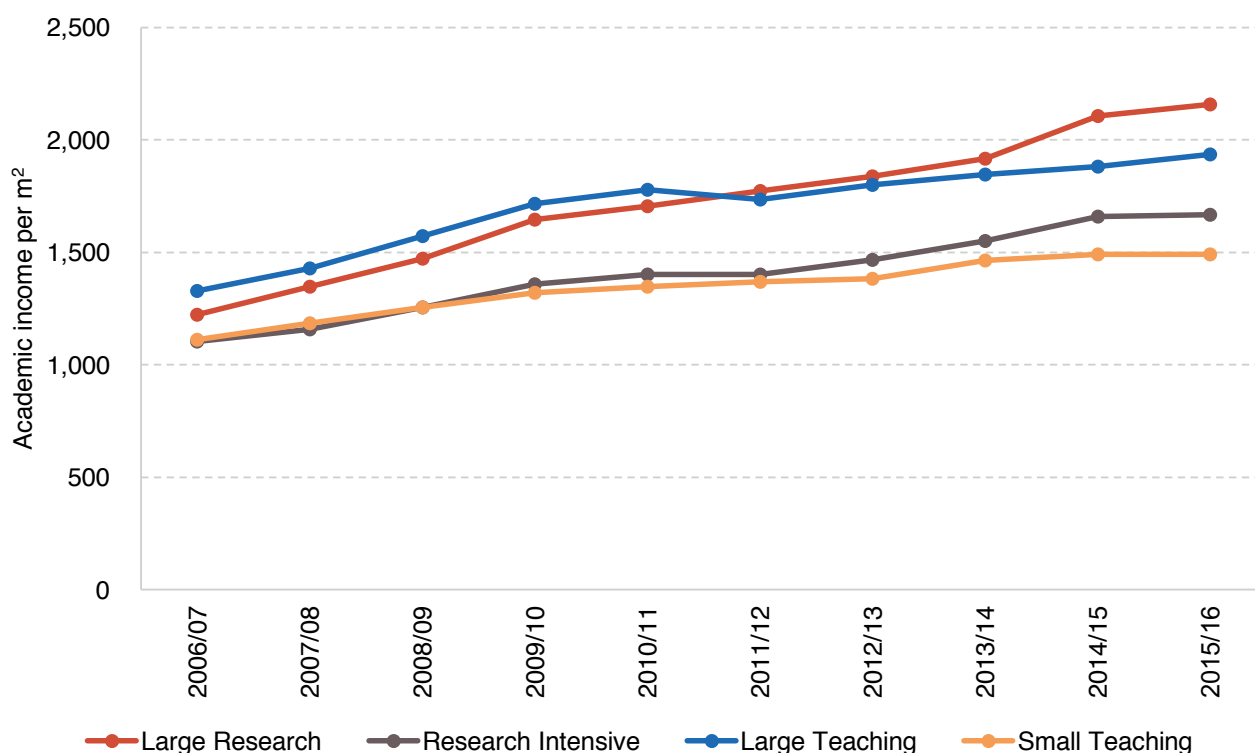
6.3.1.1. INCOME PER M² (GIA AND NIA) WHOLE SECTOR OVER TIME.



*Calculation method: 1. Academic Income (£)_y / Non-residential GIA (m²), 2. Academic Income (£)_y / Non-residential NIA (m²)

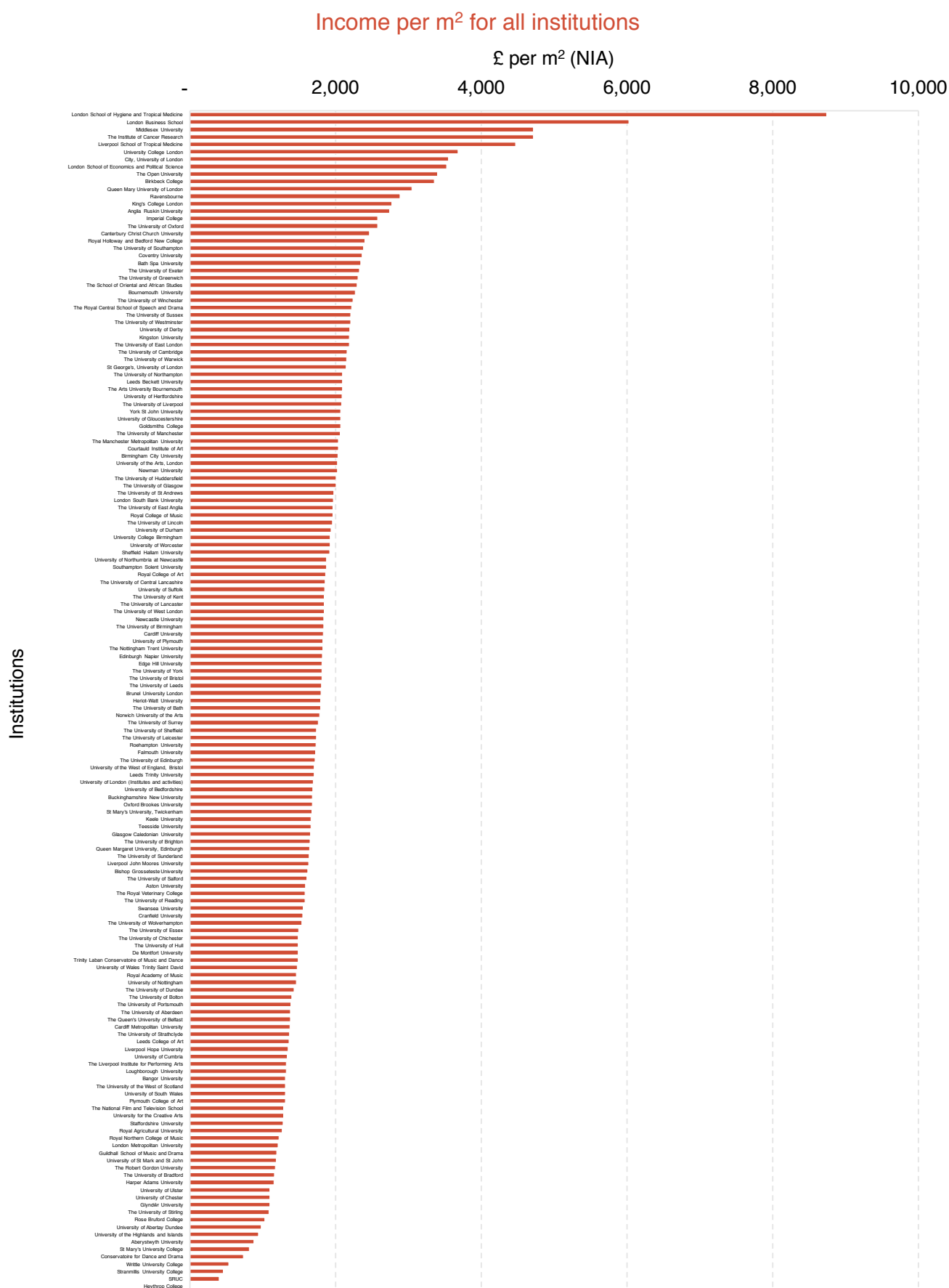
6.3.1.2. INCOME PER M² (NIA) BY SEGMENT

AUDE KPI - Academic income per NIA m²



*Calculation method: (e.g. Academic Income (£)_y / Non-residential NIA (m²)_y)

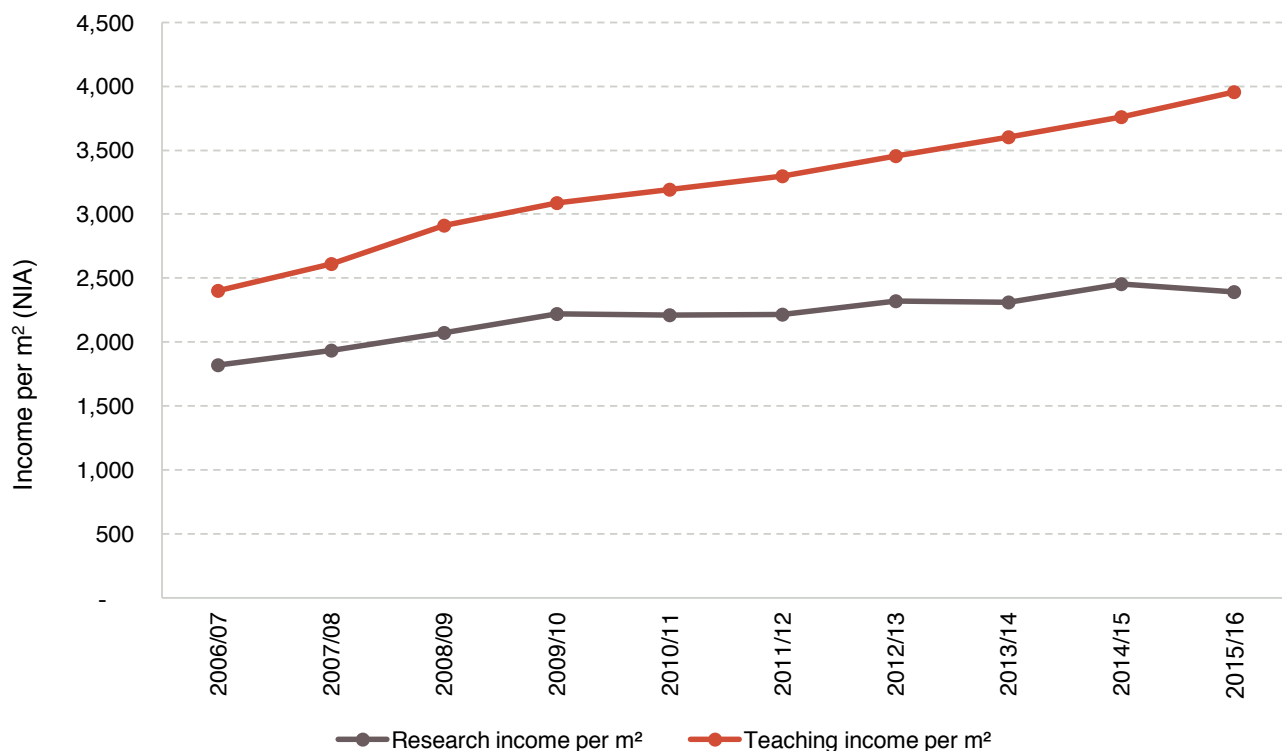
6.3.1.3. INCOME PER M² ALL INSTITUTIONS



*Calculation method: (e.g. Academic Income (£) ÷ Non-residential NIA (m²) ÷)

6.3.2. TEACHING AND RESEARCH INCOME M².

Teaching & research income per m²

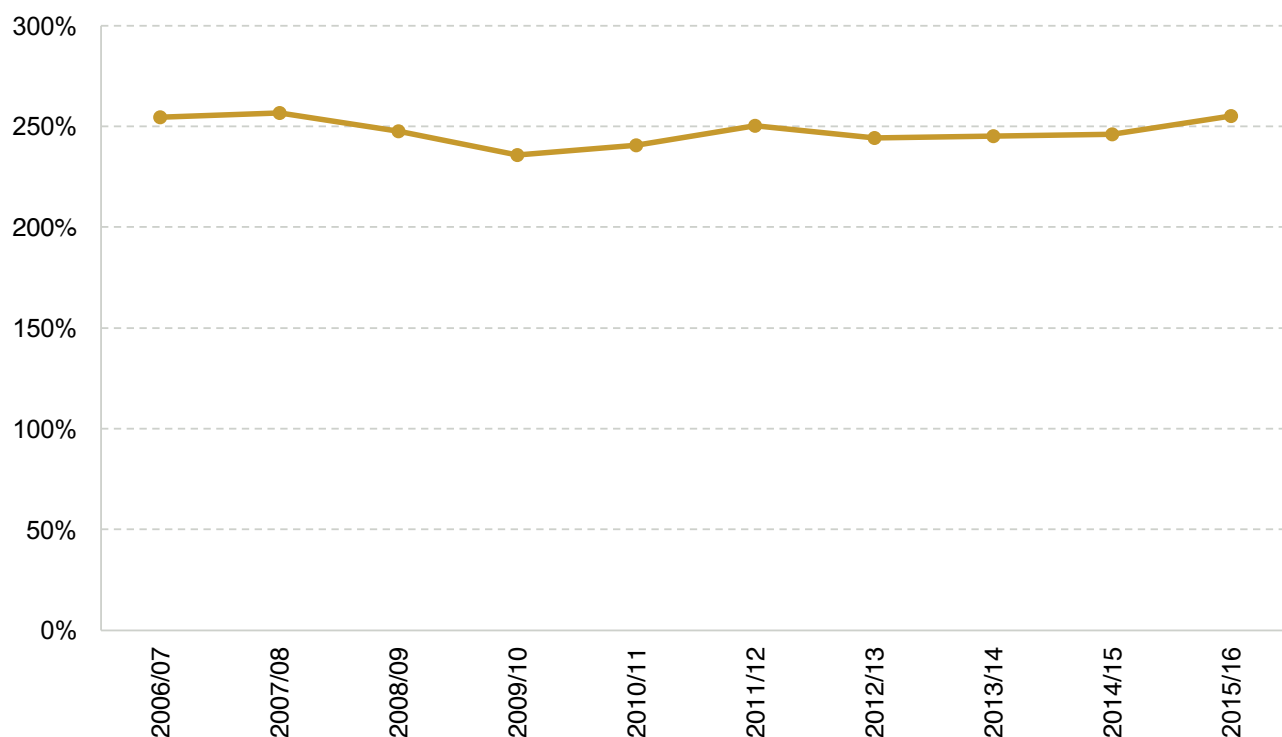


*Calculation method: 1. Research Income (£)_y / Research Space (m²)_y, 2. Teaching Income (£)_y / Teaching Space (m²)_y

6.3.3. AUDE KPI IRV AS PROPORTION OF ACADEMIC INCOME

6.3.3.1. IRV AS A PROPORTION OF ACADEMIC INCOME, WHOLE SECTOR OVER TIME

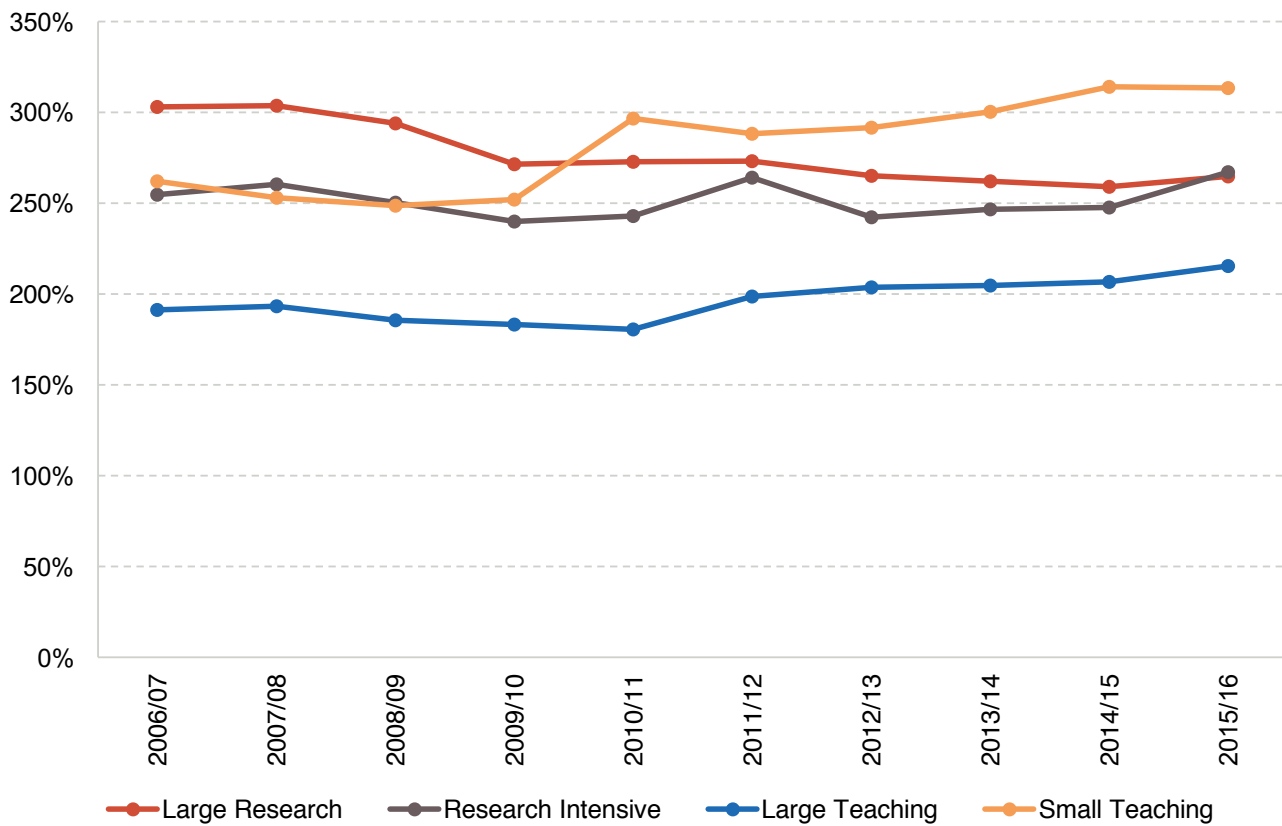
AUDE KPI - IRV as proportion of academic income



*Calculation method: Non-residential insurance replacement value (£)_y / Academic Income (m²)_y

6.3.3.2. IRV AS PROPORTION OF ACADEMIC INCOME BY SECTOR

AUDE KPI - IRV as proportion of academic income



*Calculation method: Non-residential insurance replacement value (£)_y / Academic Income (m²)_y

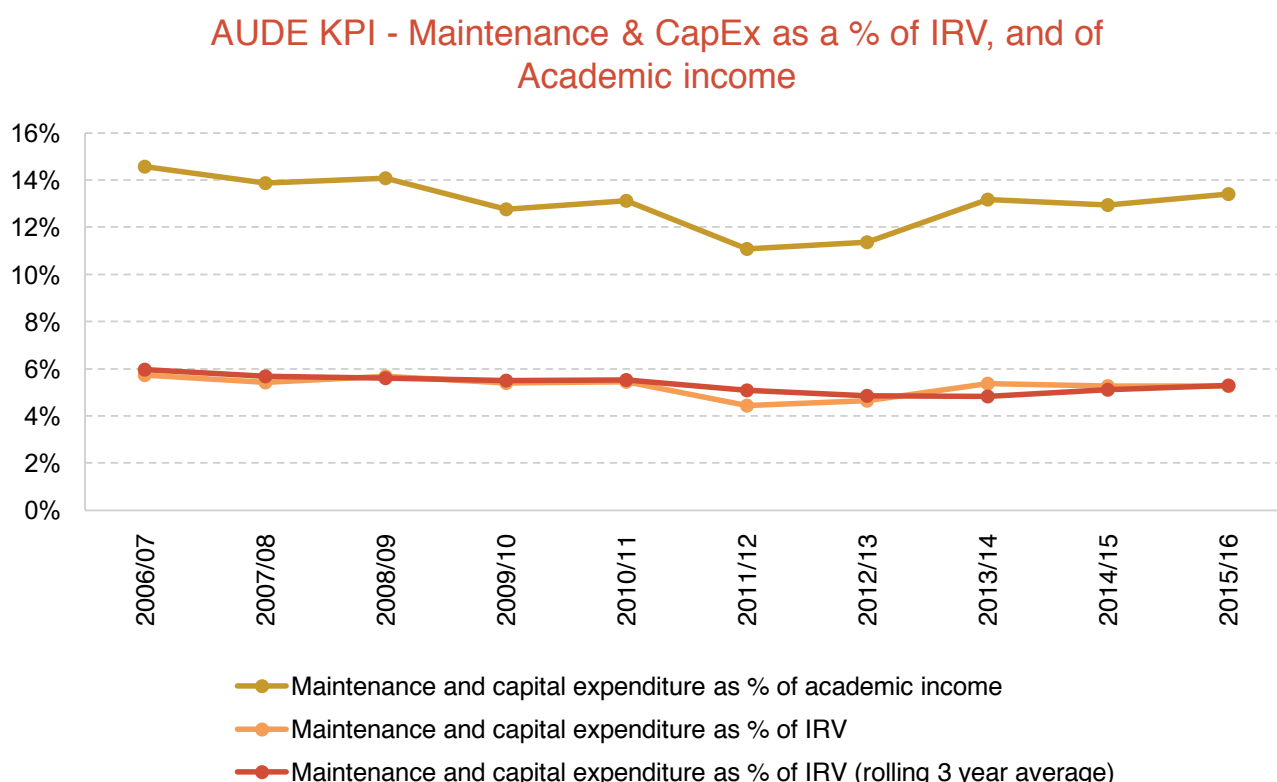
6.4. SUSTAINABILITY

The sustainability section covers the ability of institutions to continue to invest in the provision of estate. In particular, one measure is the expenditure on investment (maintenance and capital expenditure added together). This has been measured as both a percentage of IRV (i.e. the percentage of the total 'value' of the estate) and as a percentage of the academic income. Both of these measures show that investment remains constant at 5% of IRV and at 14% of academic income. The difference between the different types of institution is more difficult to determine. What is clear is that investment in the larger research institutions is more stable than in other types of institution. This is likely a result of the size of this segment and their substantial investment programmes.

In terms of energy and carbon, the story would seem to be one of decreasing carbon emissions and decreasing energy costs. Although consumption does appear to be remaining relatively constant in terms of kWh/m². There is some logic in this. Carbon reduction strategies have both reduced consumption, and also reduced the level of carbon emissions (by changing energy source and supplier), hence carbon emissions reduction. However, we are also seeing an intensification of use within the estates, (spaces being used by more people, and for longer periods of time across the day, week and year), this tends to increase demand, e.g. for lighting, heating and cooling. This then drives up consumption. The cost of energy no longer appears set to continue increasing at the rate that it previously was.

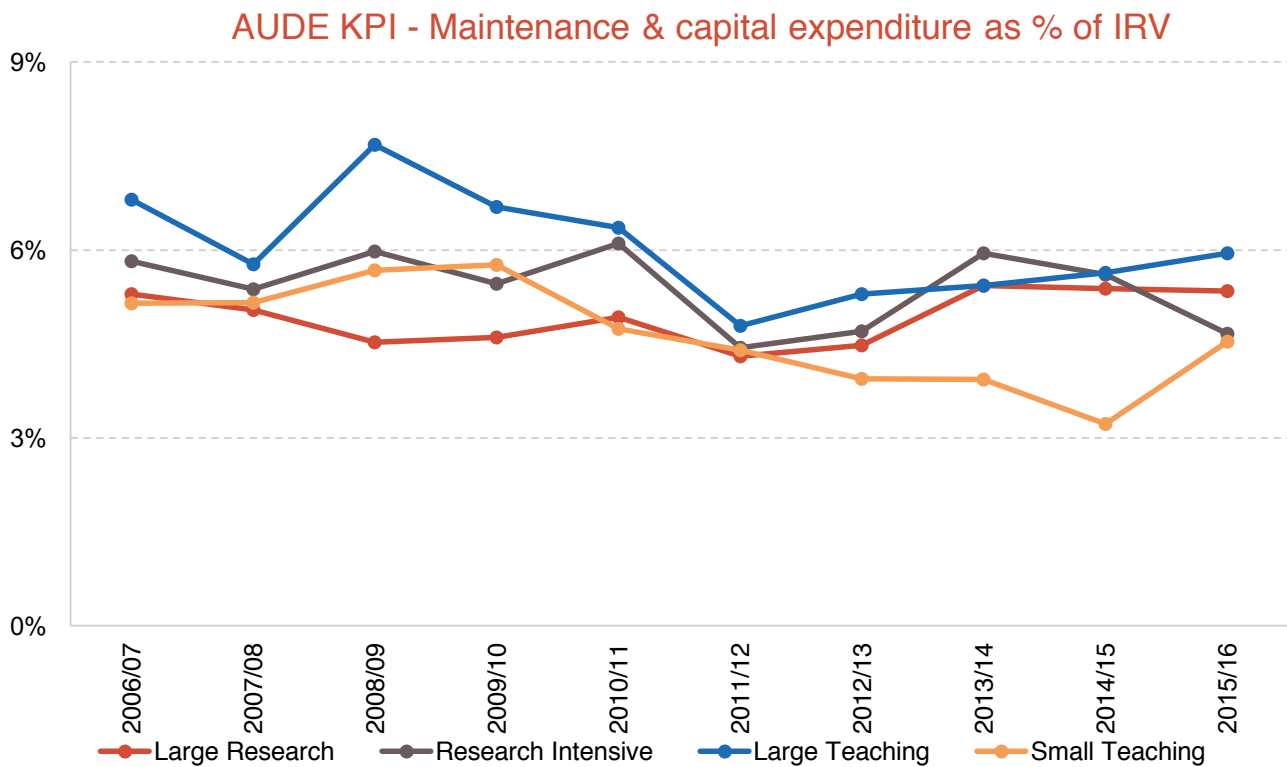
6.4.1. AUDE KPI MAINTENANCE AND CAPEX AS PERCENTAGE OF IRV

6.4.1.1. MAINTENANCE AND CAPEX AS A PERCENTAGE OF IRV WHOLE SECTOR OVER TIME



*Calculation method: 1. (Non-residential repairs & maintenance costs total (£)_y + Non-residential capital expenditure buildings (£)_y) / Academic Income (m²)_y, 2. (Non-residential repairs & maintenance costs total (£)_y + Non-residential capital expenditure buildings (£)_y) / Non-residential insurance replacement value (£)_y, 3. (Non-residential repairs & maintenance costs total (£)_y + Non-residential capital expenditure buildings (£)_y) / ((Non-residential insurance replacement value (£)_y + Non-residential insurance replacement value (£)_{y-1} + Non-residential insurance replacement value (£)_{y-2}) / 3)

6.4.1.2. MAINTENANCE AND CAPEX AS A PERCENTAGE OF IRV, BY SEGMENT

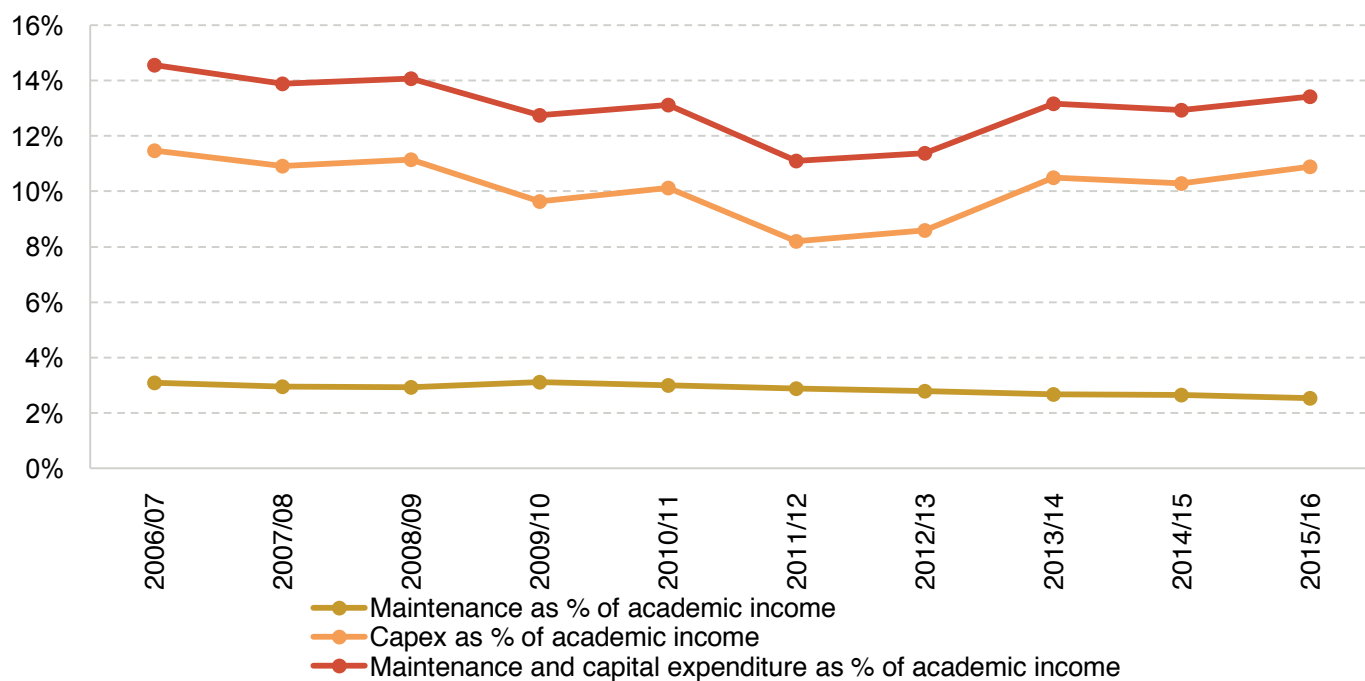


*Calculation method: (Non-residential repairs & maintenance costs total (£) _y + Non-residential capital expenditure buildings (£) _y) / Non-residential insurance replacement value (£) _y

6.4.2. CAPITAL AND MAINTENANCE EXPENDITURE AS A % OF INCOME,

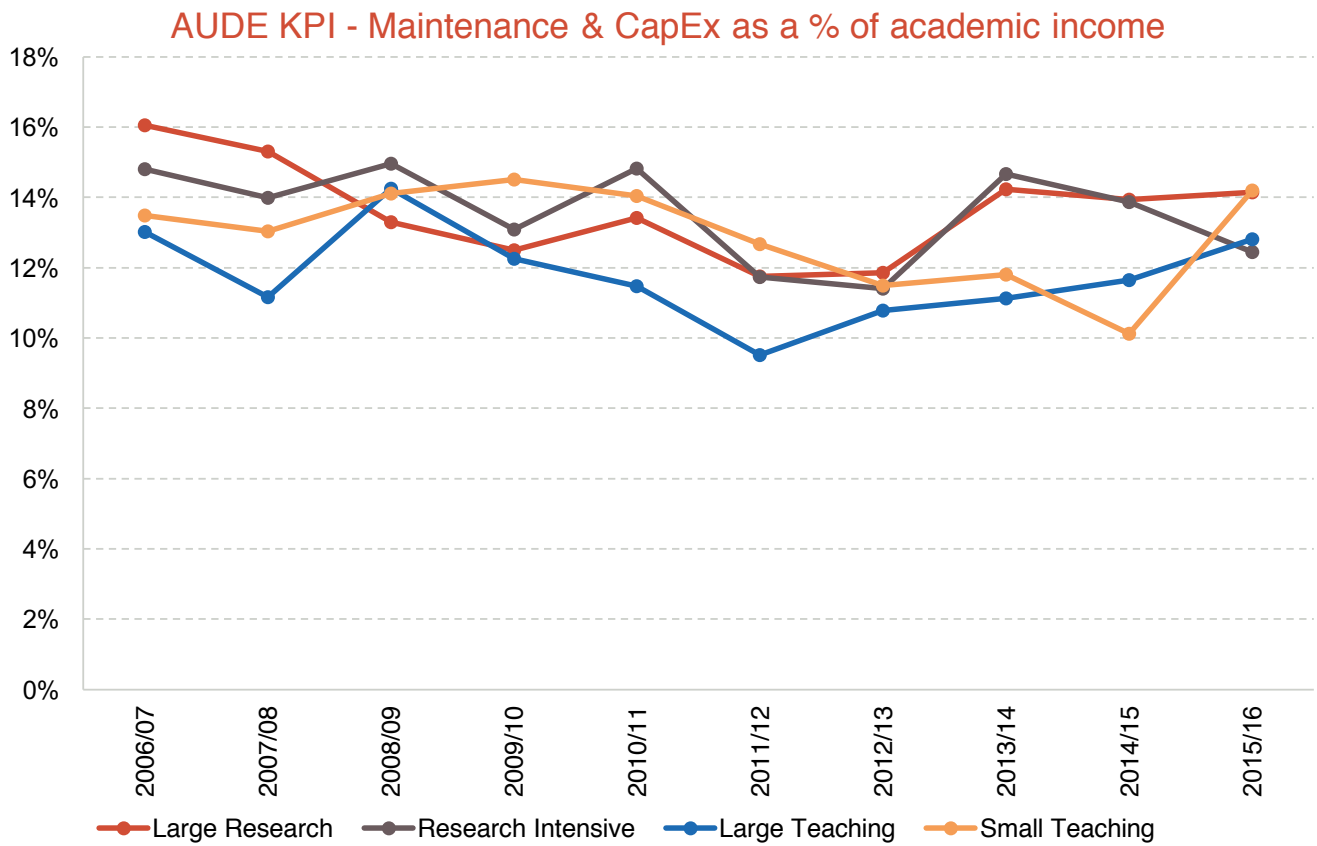
6.4.2.1. CAPITAL AND MAINTENANCE AS A % OF INCOME, WHOLE SECTOR OVER TIME

AUDE KPI - Maintenance & CapEx as a % of academic income



*Calculation method: (Non-residential repairs & maintenance costs total (£) _y + Non-residential capital expenditure buildings (£) _y) / Academic Income (£) _y

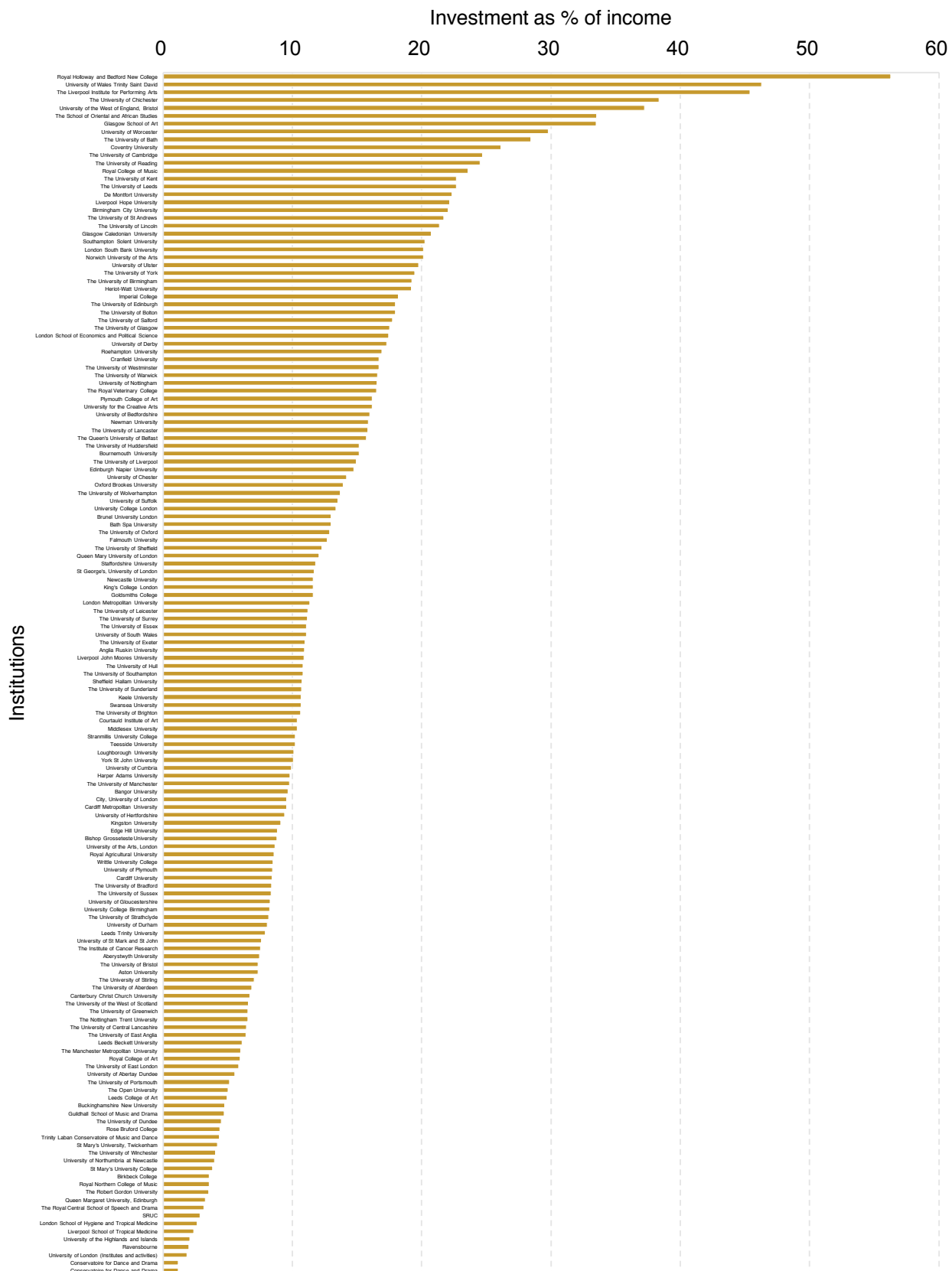
6.4.2.2. CAPITAL AND MAINTENANCE AS % OF INCOME, BY SEGMENT



*Calculation method: (Non-residential repairs & maintenance costs total (£)_y + Non-residential capital expenditure buildings (£)_y) / Academic Income (£)_y

6.4.2.3. CAPITAL AND MAINTENANCE EXPENDITURE AS A % OF INCOME, ALL INSTITUTIONS.

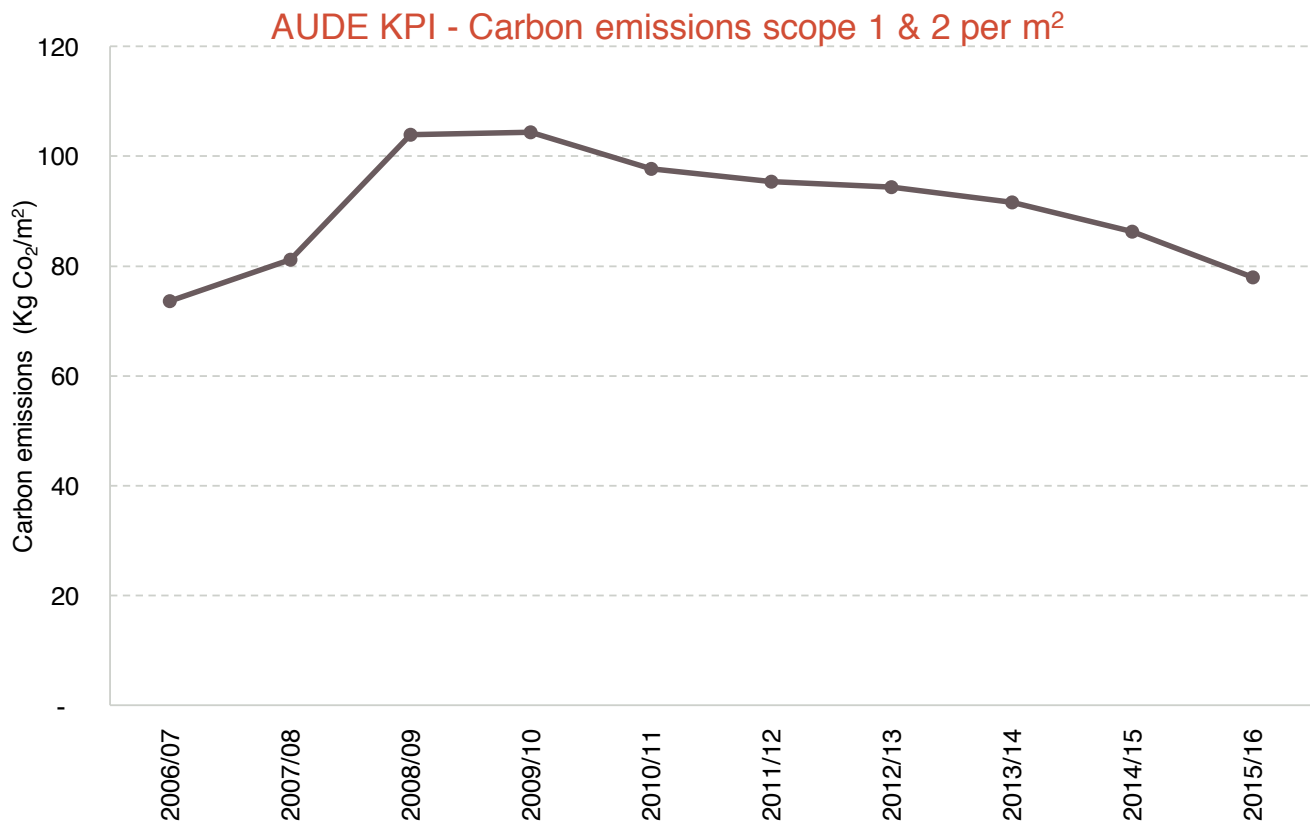
Capital & maintenance expenditure as % of income, all institutions



*Calculation method: (Non-residential repairs & maintenance costs total (£) i + Non-residential capital expenditure buildings (£) i) / Academic Income (£) i

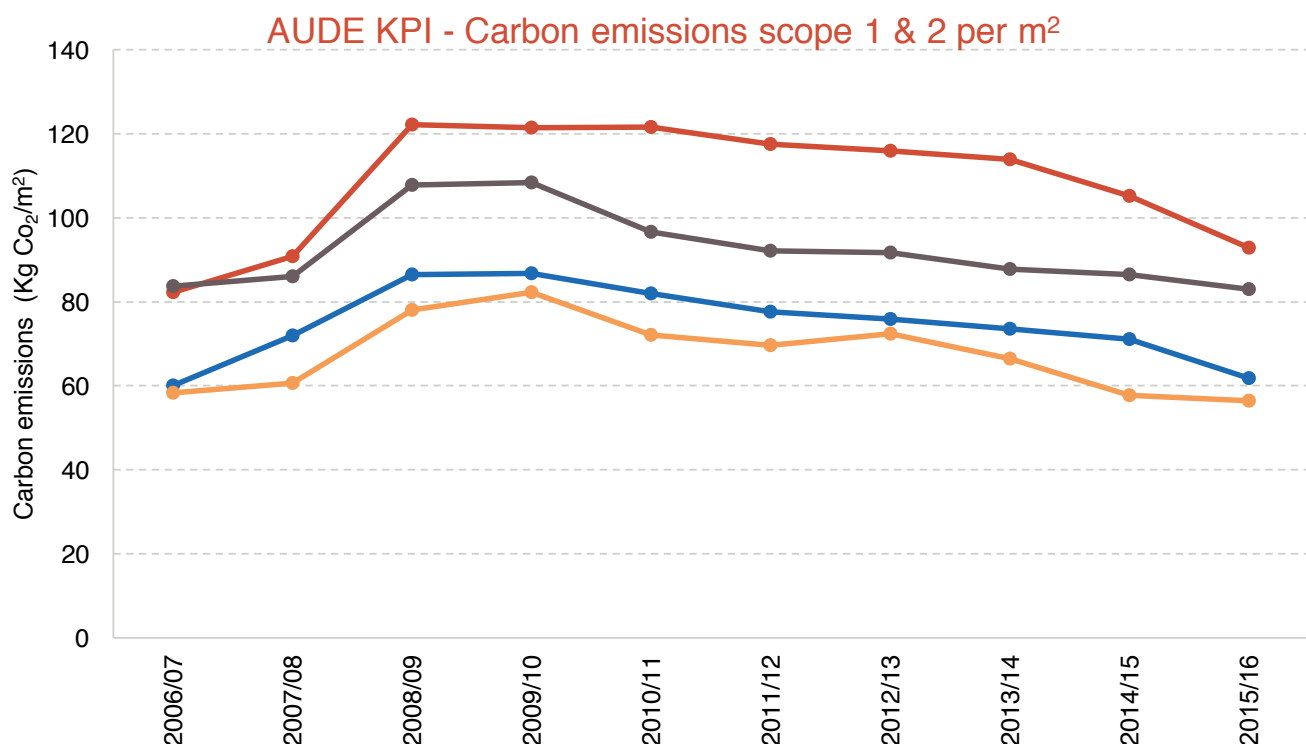
6.4.3. AUDE KPI CARBON EMISSIONS SCOPE 1 AND 2 PER M²

6.4.3.1. CARBON EMISSIONS, SCOPE 1 AND 2 PER M² WHOLE SECTOR OVER TIME



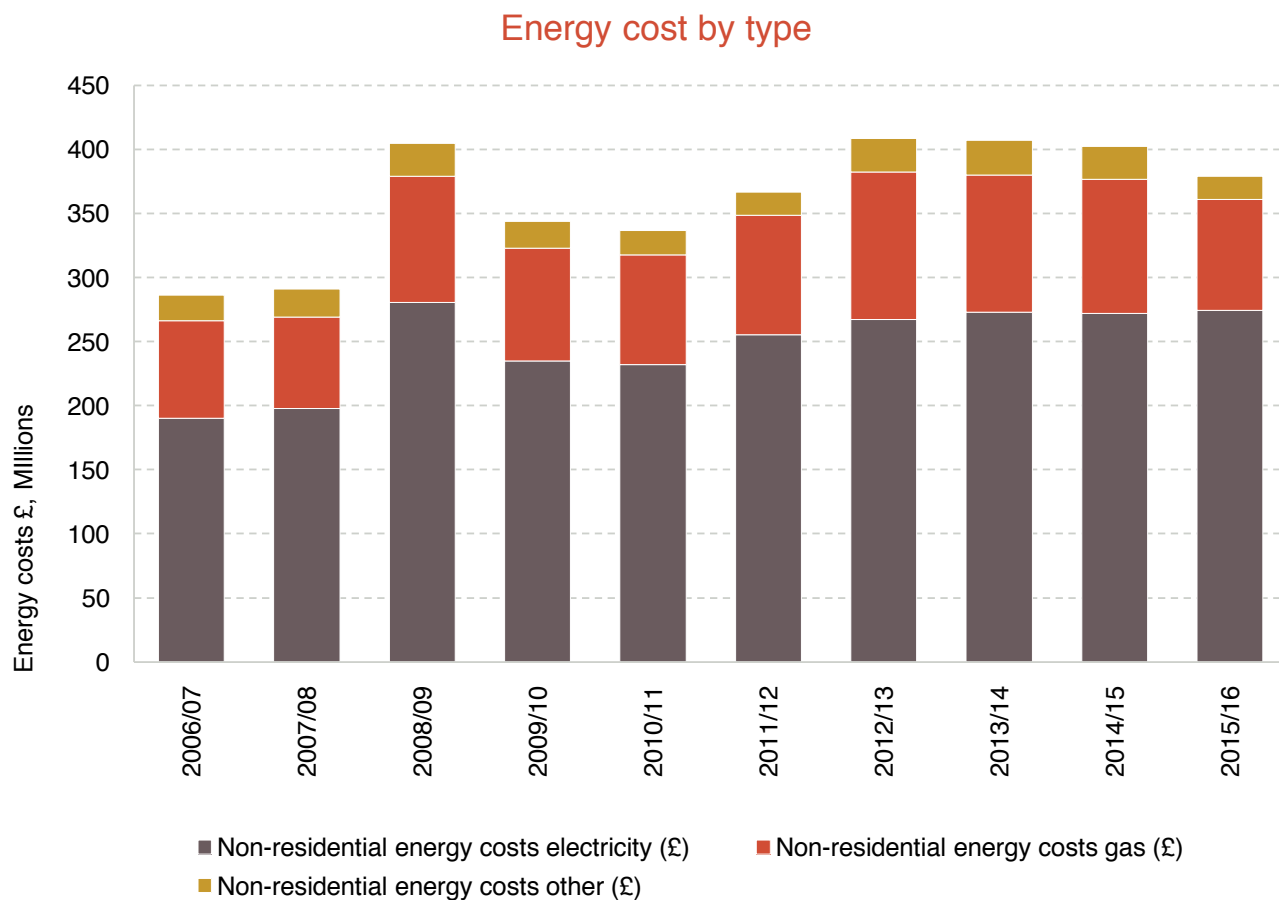
*Calculation method: Non-residential scope 1 & 2 carbon emissions total (kgCO₂e)_y / Non-residential GIA (m²)_y

6.4.3.2. CARBON EMISSIONS SCOPE 1 AND 2 PER M² BY SEGMENT

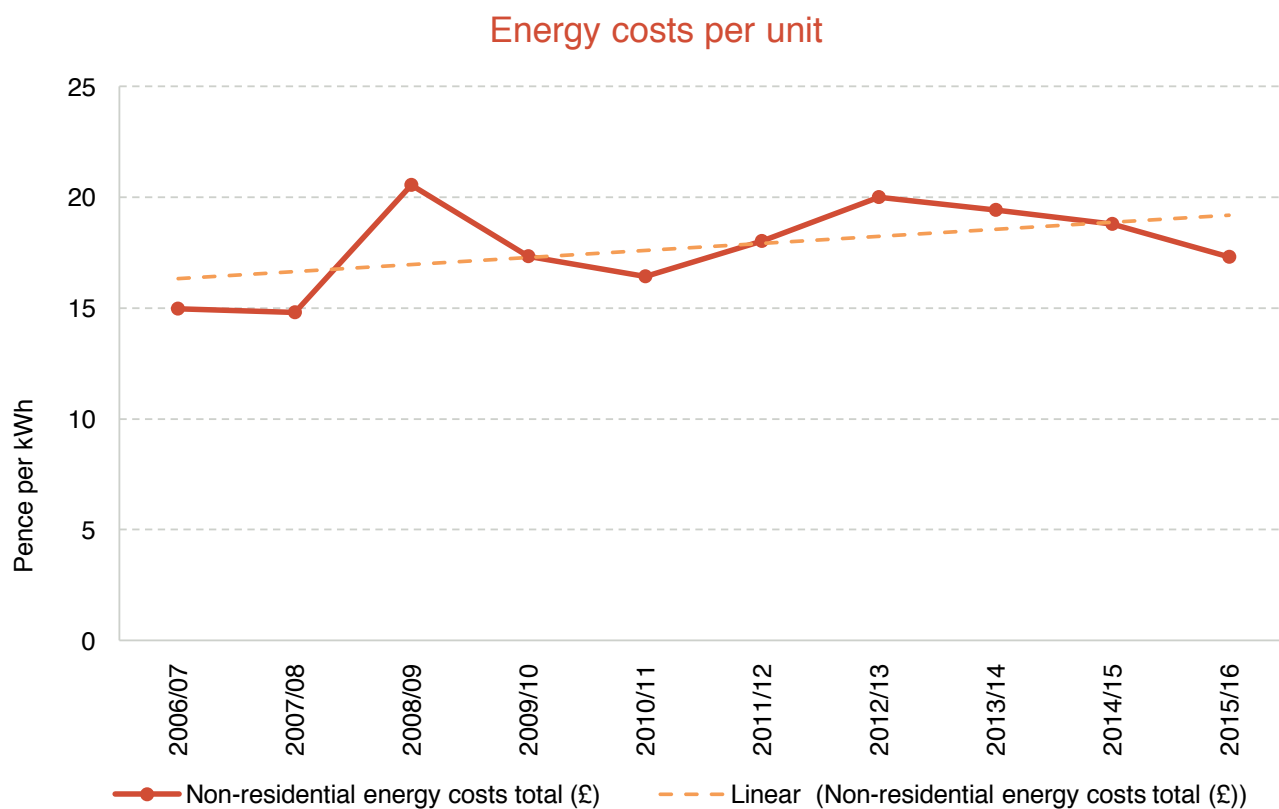


*Calculation method: Non-residential scope 1 & 2 carbon emissions total (kgCO₂e)_y / Non-residential GIA (m²)_y

6.4.4. ENERGY COST BY TYPE

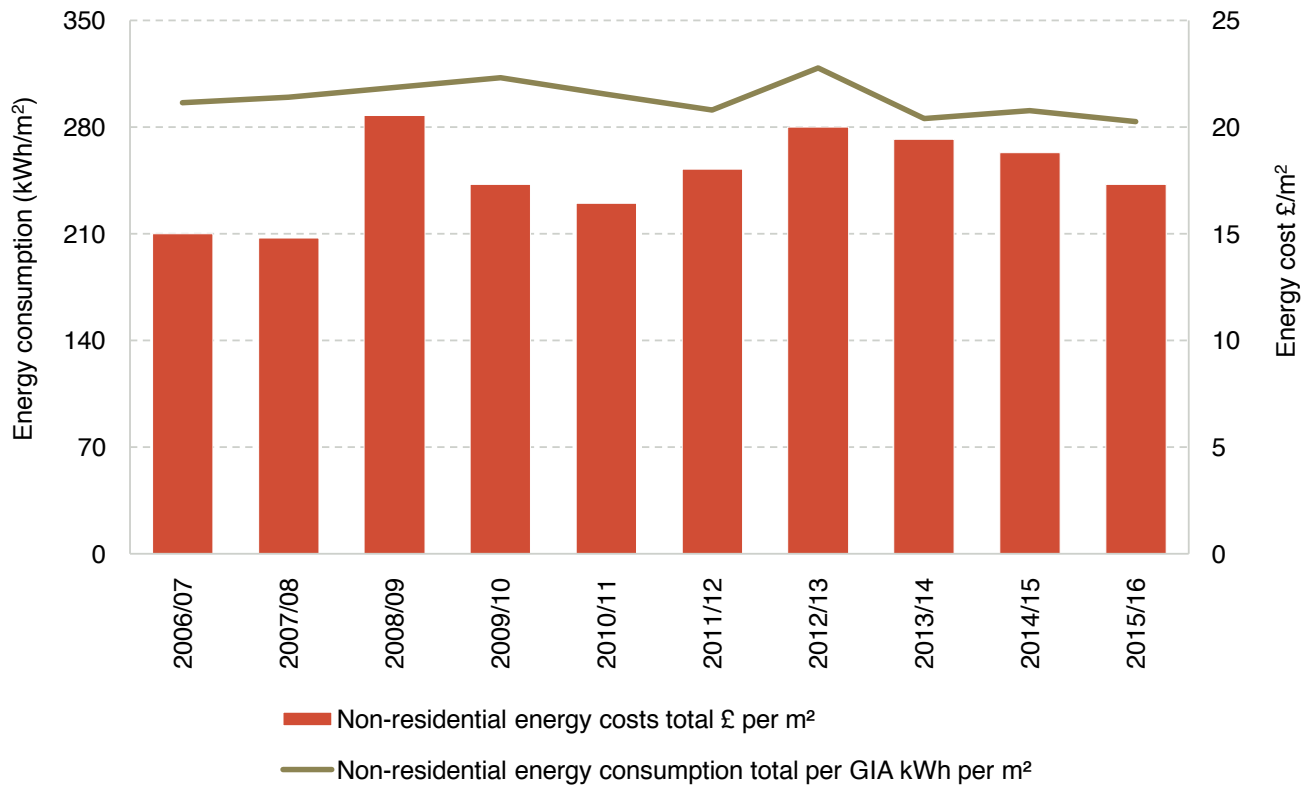


6.4.5. ENERGY COSTS PER UNIT



6.4.6. COST AND CONSUMPTION PER M².

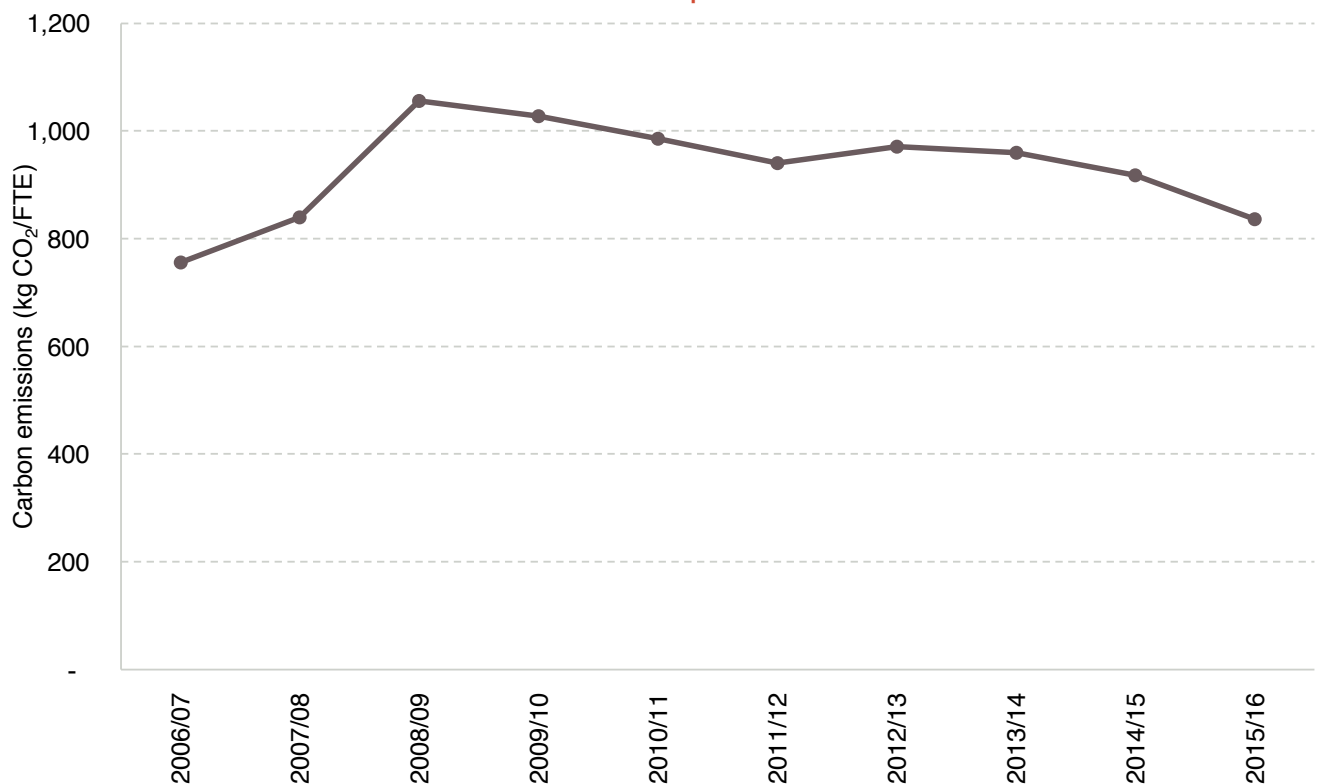
Energy cost & consumption per m²



*Calculation method: Non-residential scope 1 & 2 carbon emissions total (kgCO₂e)_y / Non-residential GIA (m²)_y

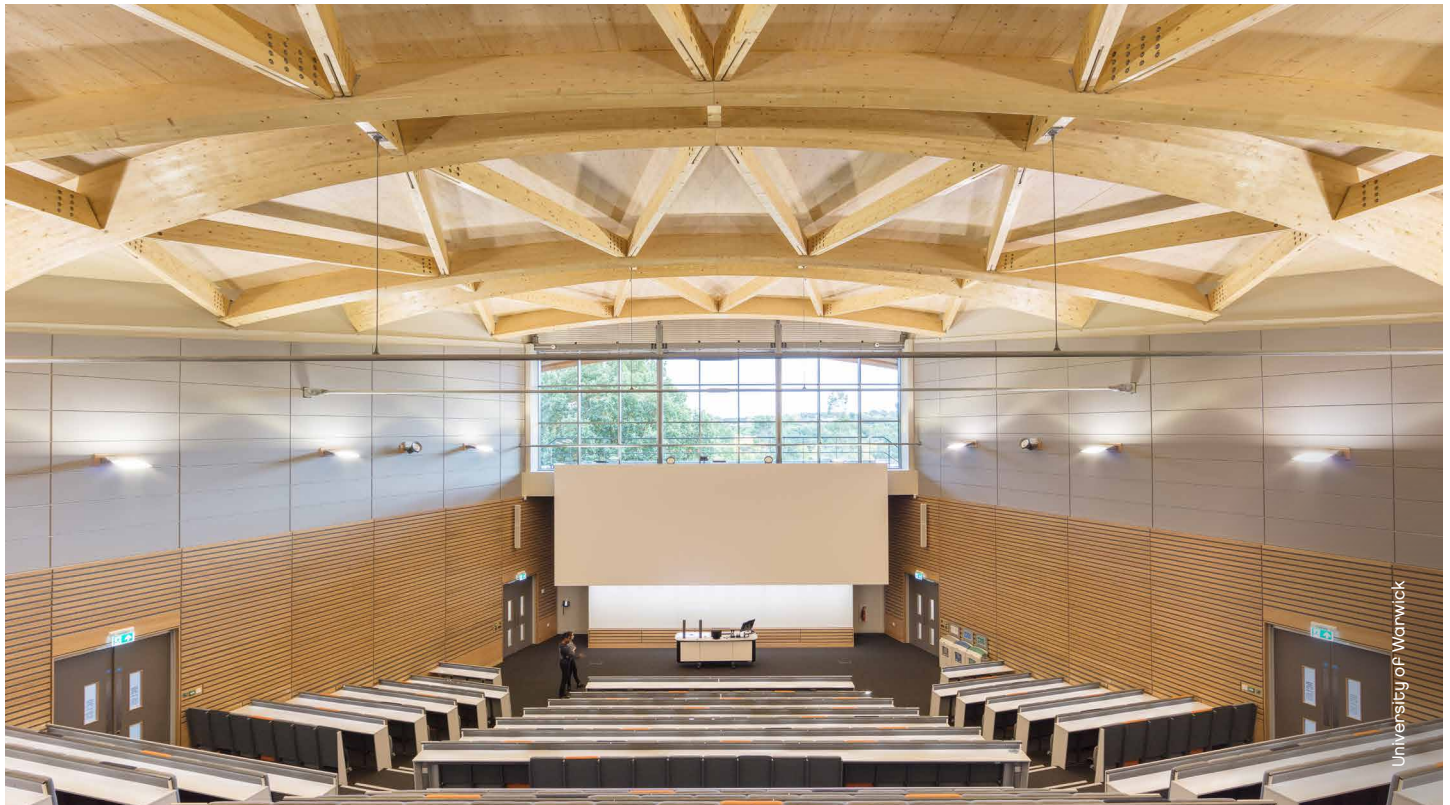
6.4.7. EMISSIONS PER FTE

Emissions per FTE



*Calculation method: Non-residential scope 1 & 2 carbon emissions total (kgCO₂e)_y / (Teaching student FTE_y + Research student FTE_y + Total staff FTE_y)

6.5 CASE STUDIES



A NEW TEACHING AND LEARNING FACILITY

THE CHALLENGE

The University of Warwick is growing. Since the mid-60s intake numbers have grown from 500 to almost 30,000. The Oculus project came about because it needed to meet the requirements of the ever-growing student population for teaching and learning space.

THE PROCESS AND SOLUTION

A timetable model calculated the demand for teaching spaces which gave opportunity to provide centrally-timetable teaching rooms within a dedicated, central teaching and learning building rather than located in faculty or departmental buildings. This would then enable students from all departments to mix and to have a more consistent teaching space experience.

As the design process progressed, it became more and more evident that as well as teaching rooms, the university needed to provide more social learning spaces - spaces where students could spend anything from just a few minutes before a seminar to an entire day of study.

THE RESULT

The Oculus was delivered in the autumn term of 2016, within its £19m budget, and of such excellent quality that it's won the praise of students, staff and visitors alike. It features a 500-seat lecture theatre (the biggest on campus), a four-screen video wall, 12 top-quality, flexible teaching spaces and integrated internal and external social learning spaces.

Professor Tom Marsh, head of astronomy and astrophysics, had this to say about the Oculus: "It has wonderful, natural light inside, and I was struck by how quickly students could be found working together in the areas outside the formal teaching rooms. I defy anyone not to be impressed when they first go into the large lecture theatre. My main worry for my first lecture there was whether I could compete with the room."

The official opening ceremony for the building took place in March of 2017, when The Princess Royal visited our campus to unveil a plaque. It has since been recognised in the RIBA and Construction News awards, and will be a key facility for our campus community for years to come.



MANAGING CARBON EMISSIONS

THE CHALLENGE

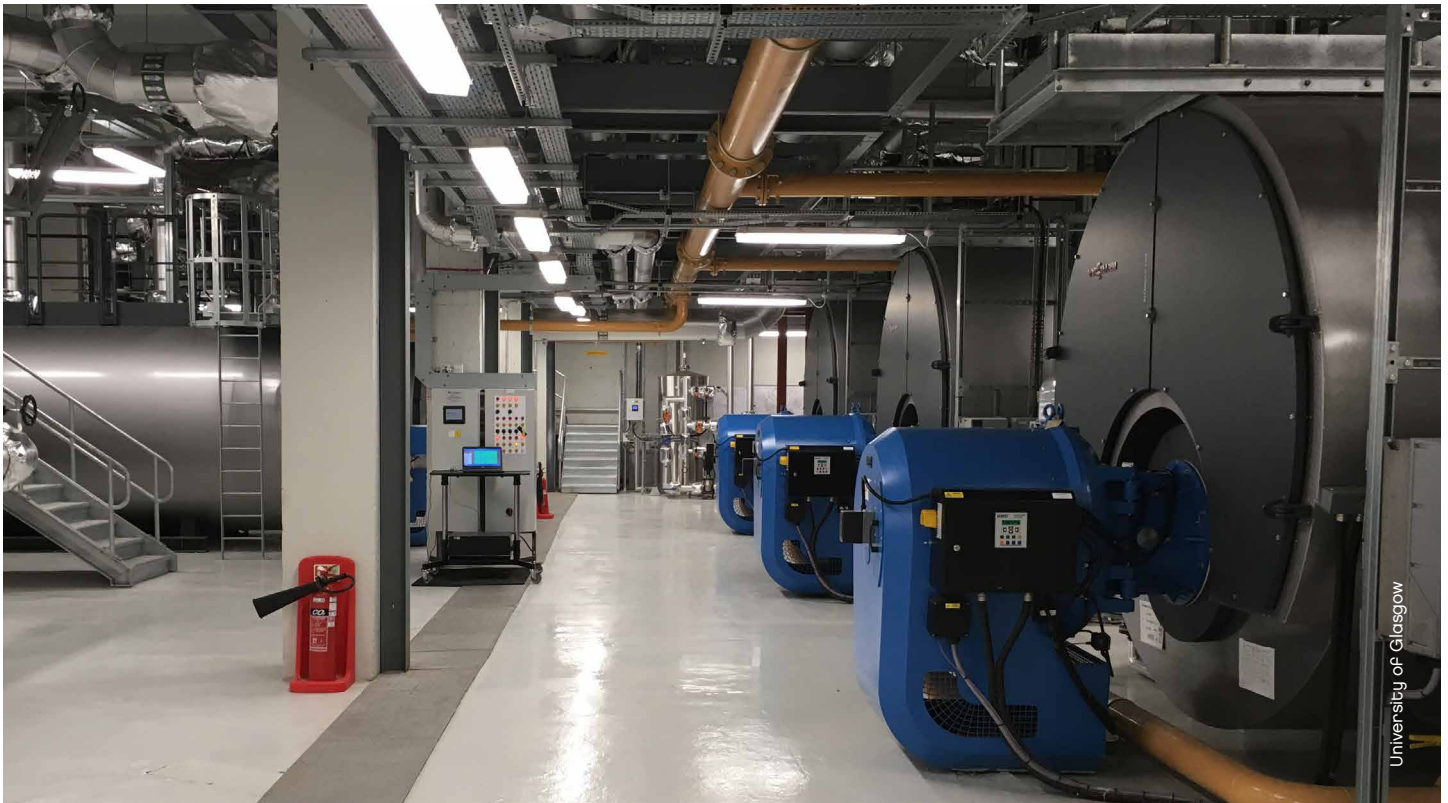
The University of Warwick's proposed strategy will look towards a sustainable campus. This vision has the potential to demonstrate and encourage the infrastructure, technology and behaviours that enable a sustainable way of life, raising awareness and providing a positive and lasting experience for all those study at, work at, visit or live near the campuses.

THE PROCESS AND SOLUTION

The university carried out a comprehensive review of the original carbon plan. The developed plan looks more closely at university expansion and changes in UK energy policy than ever before. In order to meet the targets set by the carbon management programme, the universities have developed a new Energy Centre, along with an expansion programme of the district heating network to increase the Combined Heat and Power (CHP) available load.

THE RESULT

With a growing student population and estate, the new Cryfield Energy Centre provides a significant part of the targeted low carbon, low cost heat and power across the campus, allowing additional funds to be redistributed for research and curricular resources. The university's estates office has shown a commitment to continuous improvement which has led to ongoing innovation and efficiency improvements.



SUSTAINABILITY: CARBON EMISSIONS

THE CHALLENGE

The University of Glasgow's main campus is situated within the heart of the west end of Glasgow. Until 2016 the campus buildings were heated by steam supplied from an aging central boiler house. In 2014/15 it was recognised that the plant was inefficient, high maintenance and no longer cost effective. With the university having a continuous requirement for heat a number of challenges had to be considered for the installation of a new system. The scheme involved installing 6km of new pipework across a live campus site whilst a supply to existing buildings had to be maintained throughout the project, requiring the use of temporary boiler plant.

THE PROCESS AND SOLUTION

In response to these challenges a new heat and power network was developed, connecting circa 50 buildings to an energy centre where a 34 MW Combined Heat and Power (CHP) system provides the base load heating and power requirements to these buildings. Each building on the new network is fitted with highly efficient plate heat exchangers for both the heating and the domestic hot water.

THE RESULT

A key requirement of the Combined Heat and Power Quality Assurance (CHPQA) scheme is that the system runs in an efficient and effective manner as this scheme assesses the fuel inputs with regards to the power and useful heat generated. With the initial assessment year (calendar year 2016) taking consideration of testing and commissioning, the quality index level required is 95. The system was able to secure CHPQA certification by exceeding the QI required. The current assessment year requires a higher QI figure of 105 which the system is currently on track to achieve.

The Scope 1 and 2 carbon efficiency of the estate, before the CHP project was c.122 kg CO₂e per m². The university estimates that over the past 12 months, the new district heating system has delivered c.4500 ton of carbon emissions savings, resulting in an improved carbon efficiency of c.110 kg CO₂e per m².

The total capital cost of the project was £21million, with operational savings of c.£1million realised in the first year of operation.



Edge Hill University

MAINTAINING 'BEAUTIFUL CAMPUS'

THE CHALLENGE

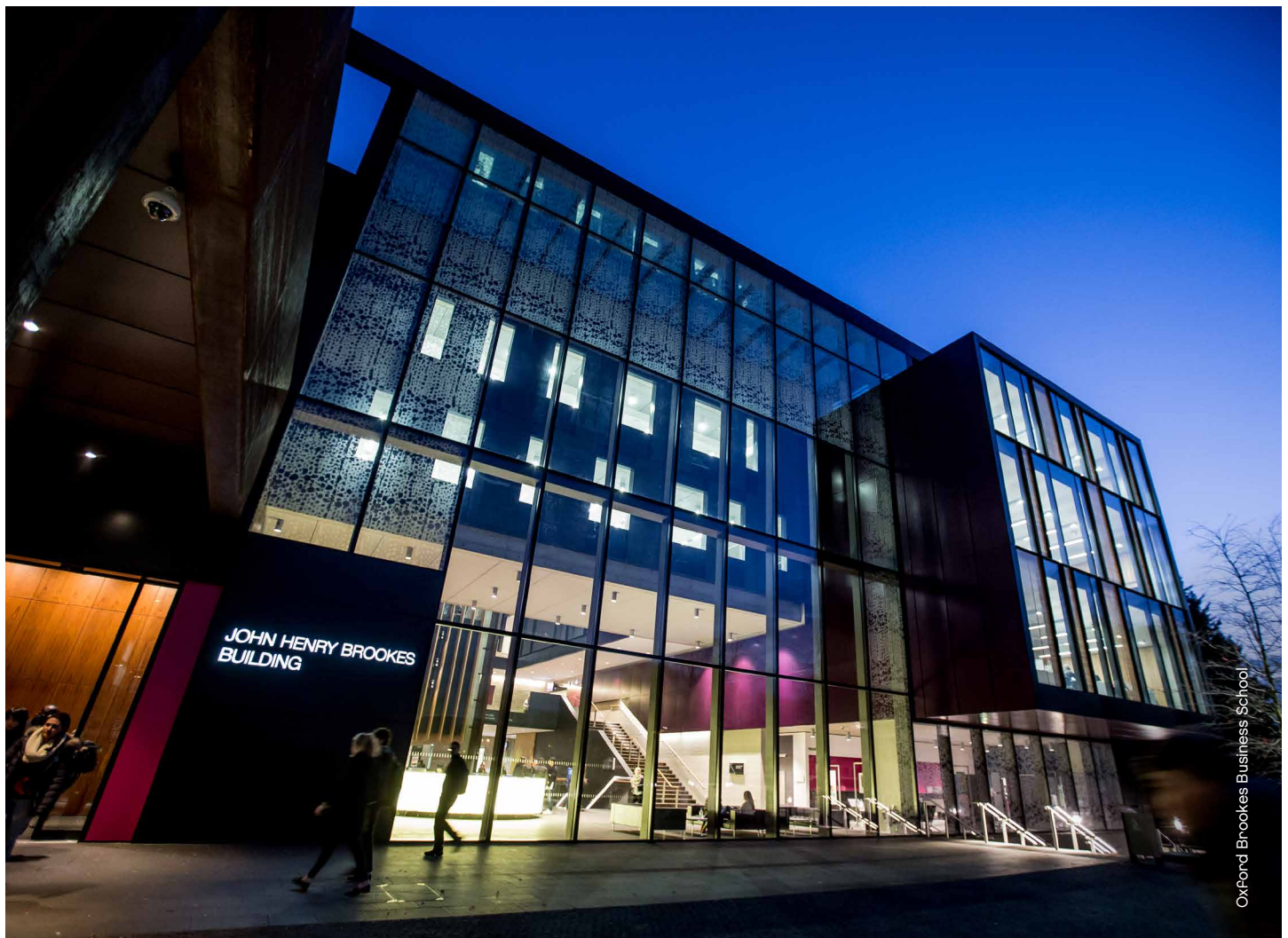
The national recognition of Edge Hill University's award winning "Beautiful Campus" has been achieved through the investment of circa £300 million over the last decade and through developing a reputation in the sector for achieving excellent value for money while producing a high-quality campus environment and student experience. Given the award winning, high quality residential accommodation on campus, there has been an increasing demand from second and third year students to live on campus.

THE PROCESS AND SOLUTION

In response, the University invested £11m in the Woodland's Court development, which provides 181 en-suite bedrooms in a town house configuration to specifically cater for the requirements of students wishing to have the benefit of living in a shared house, whilst residing on our award-winning campus. Following recent benchmarking exercises across the HE sector, the university has achieved 20% betterment in terms of cost and 70% betterment in terms of programme. The Woodland's Court development provided a high-quality facility, with a programme that was delivered in 26 weeks, with an exceptional cost per bedroom unit rate.

THE RESULTS

Based on the recent halls questionnaire completed, 97.34% of residents indicated that the latest phase of residences provided excellent value for money. Importantly, of the respondents, 96.46% provided positive comments to describe their residential life. The fact that the university was the winner of the Times HE University of the Year award in 2015 and was voted the top North West University in 2014 and 2016 in relation to student satisfaction in National Student Satisfaction survey is testament to the quality of our residential developments.



NEW METERS FOR OLD

THE CHALLENGE

To refurbish a 1950s vacant building on the central campus, Oxford Brookes University stripped it back to the shell and completely renovated the space as offices for the Oxford Brookes Business School, campus pool teaching and social learning spaces.

THE PROCESS AND SOLUTION

The refurbishment vacates old, uneconomic space on other sites and maximises the use of space creating bright and innovative spaces. Library, student support and catering needs are met in capacity in existing services and facilities on the campus.

THE RESULT

Over 8500m² of space was refurbished and 850m² new-build space was created to replace the main hall following the demolition of some 1300m² of poor quality space which was not cost effective to refurbish.

The building is fully accessible and is now occupied by 320 staff and researchers. Over 1300 teaching seats and 400 social learning spaces and a café were created, all for just over £3300 m². 10,000 m² of space has been vacated at another site for disposal.



This section looks only at the residential estate of institutions. Firstly, for some institutions, the income generated by this area of activity can be substantial. 26 institutions generate over £20m per annum from their residence and catering operations, with 4 generating over £50m.

The data collected this year has returned to separating out residencies income and catering income. For the 3 previous years (i.e. 12/13, 13/14, 14/15) the income was totalled. Where possible we have made adjustments to reflect this.

The nature of student accommodation provision is changing substantially, and will continue to change as private providers develop additional accommodation geared particularly at students. Institutions have taken up leases and agreements with these providers typically to provide accommodation to meet their guaranteed places, as well as other places. This has been a direct requirement of the increase in student numbers.

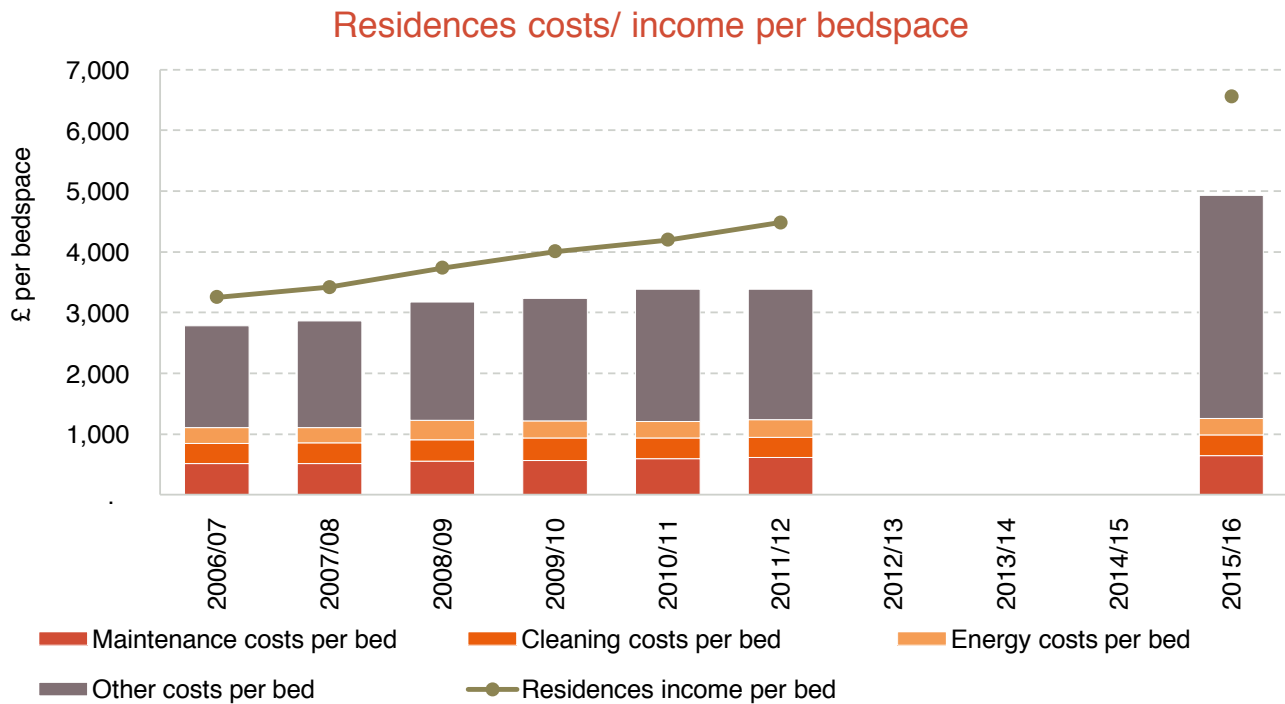
The more detailed analysis of student term time accommodation shows how the different types of students (under and post graduate, home and overseas) take up different types of accommodation. What this shows is the relatively small numbers of students who currently occupy private sector hall type accommodation, and the very large numbers of students who rent in the student housing market (made up typically of registered Houses in Multiple Occupation, HMO's).

The provision of student accommodation is going to continue to be an issue for institutions as the provision of appropriate accommodation is so central to the choices that individual students make. Also, as house prices in some areas increase significantly, the provision of affordable accommodation is going to be increasingly challenging.

Institutions have been spending significant capital on their own residential estate, and continue to spend nearly £500m per annum. This potentially reflects the fact that there is still significant amounts of University own accommodation that is in less than good condition or suitability. 23% of bedspaces are in condition C or D, and 25% was built before 1979. The likelihood is that this type of accommodation does not meet the standards that students and their parents will expect in today's competitive market.



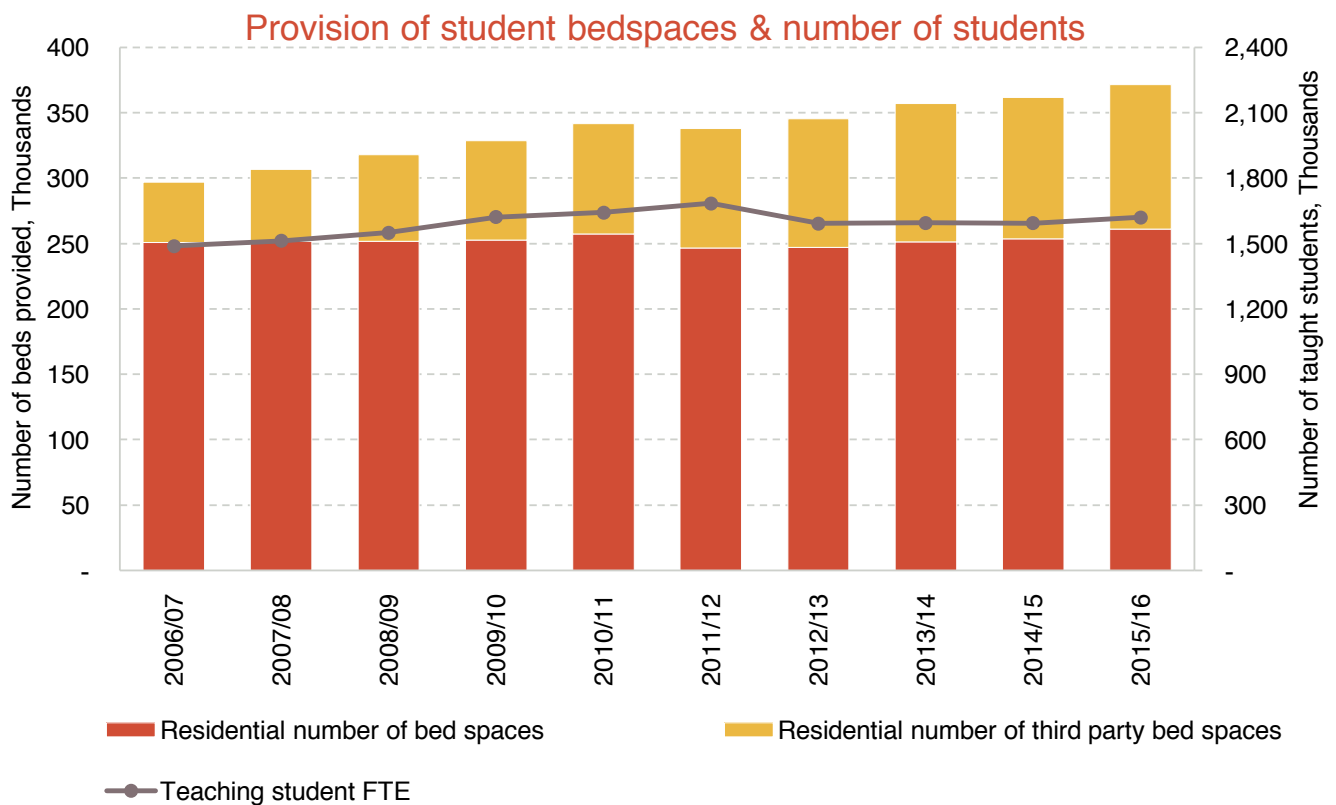
7.2. INCOME EXPENDITURE PER BED



*Calculation method: (e.g. Residential cleaning costs (£) / Residential number of bed spaces_y)

2 Data for 2012/13 to 2014/15 contains catering income and expenditure and is not comparable to this data and has been excluded.

7.3. PROVISION OF STUDENT BEDSPACES (HEI AND 3RD PARTY LEASED) AND TAUGHT STUDENT NUMBERS.

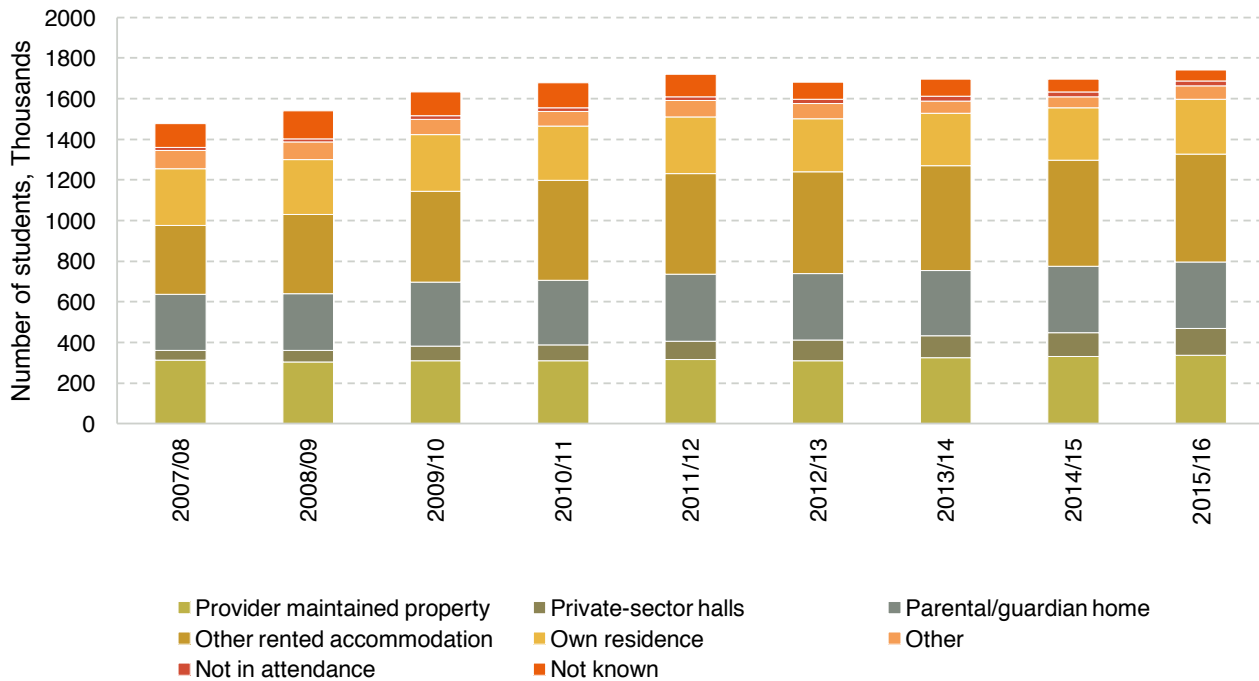


7.4. TYPE OF TERM TIME ACCOMMODATION

7.4.1. TYPE OF TERM TIME ACCOMMODATION, ALL STUDENTS.

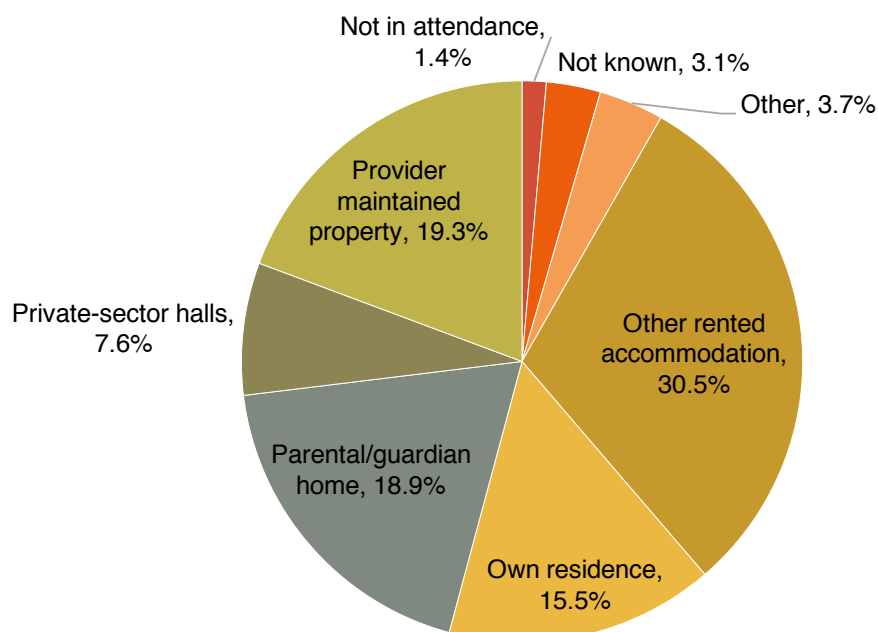
7.4.1.1. TYPE OF TERM TIME ACCOMMODATION, ALL STUDENTS, ALL INSTITUTIONS OVER TIME

Type of term time accommodation (All)

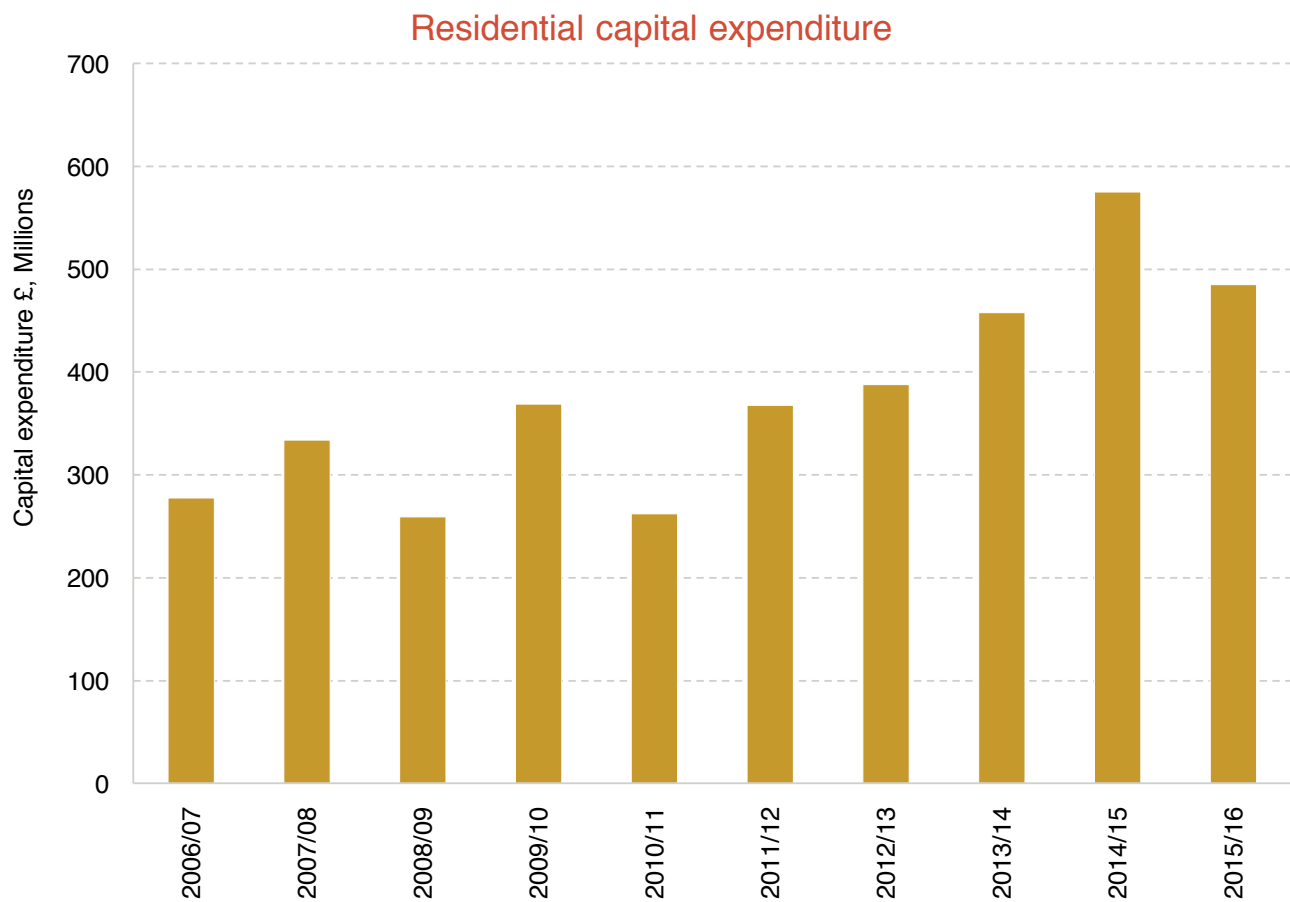


7.4.1.2. TYPE OF TERM TIME ACCOMMODATION 2015/16 ALL STUDENTS, PERCENTAGE BY TYPE

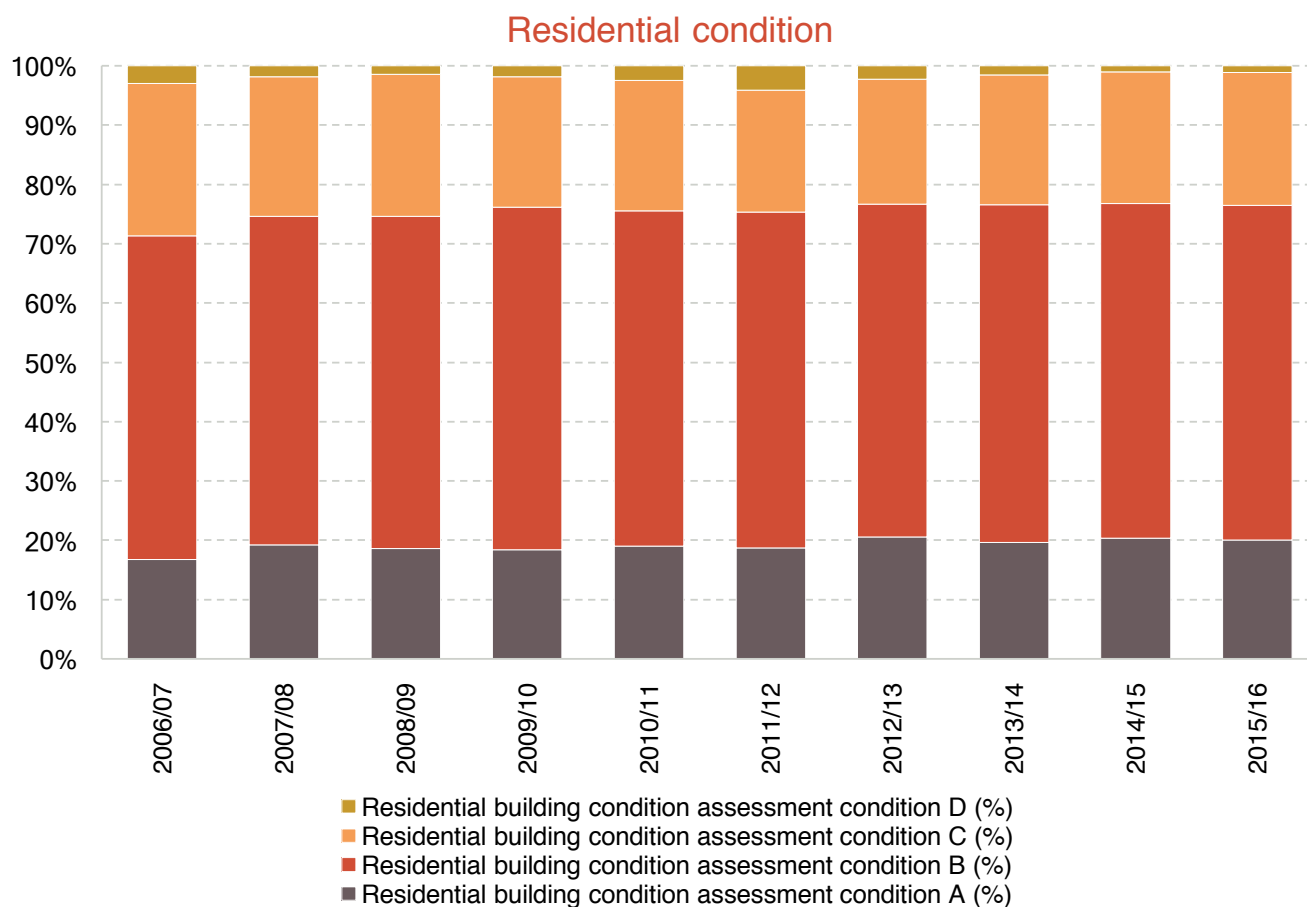
Term time accommodation 2015/2016 (All)



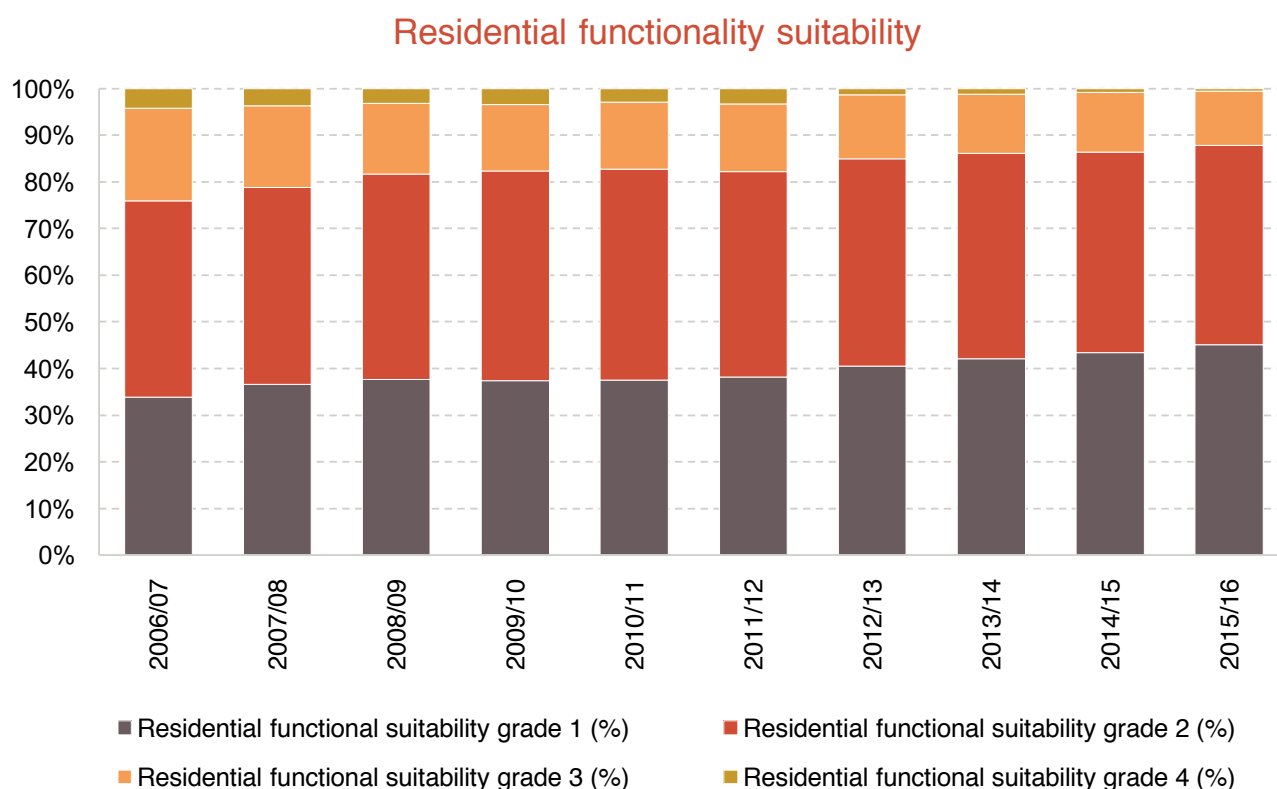
7.5. RESIDENTIAL CAPITAL EXPENDITURE



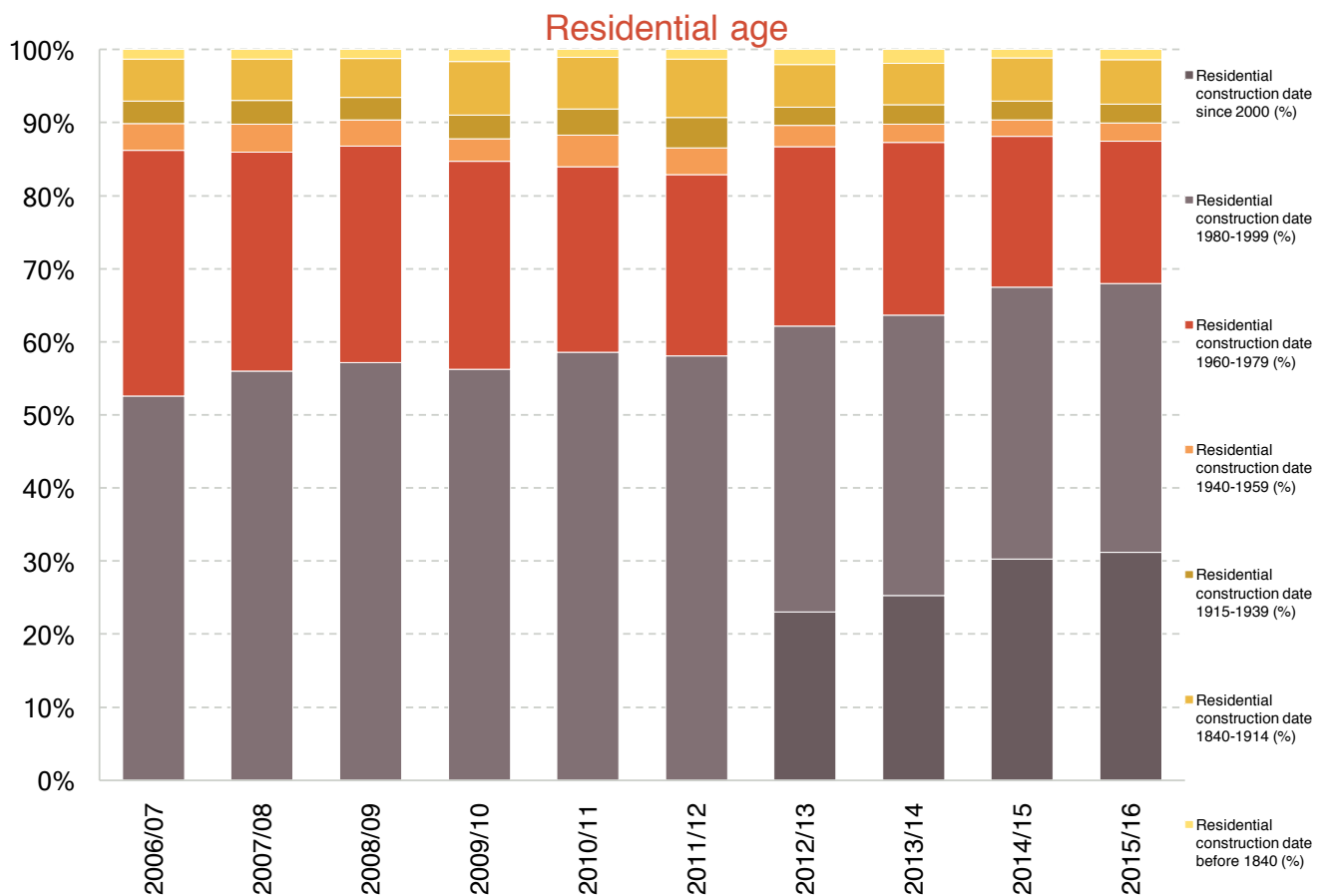
7.6. CONDITION, PERCENTAGE IN CONDITION A, B, C AND D.



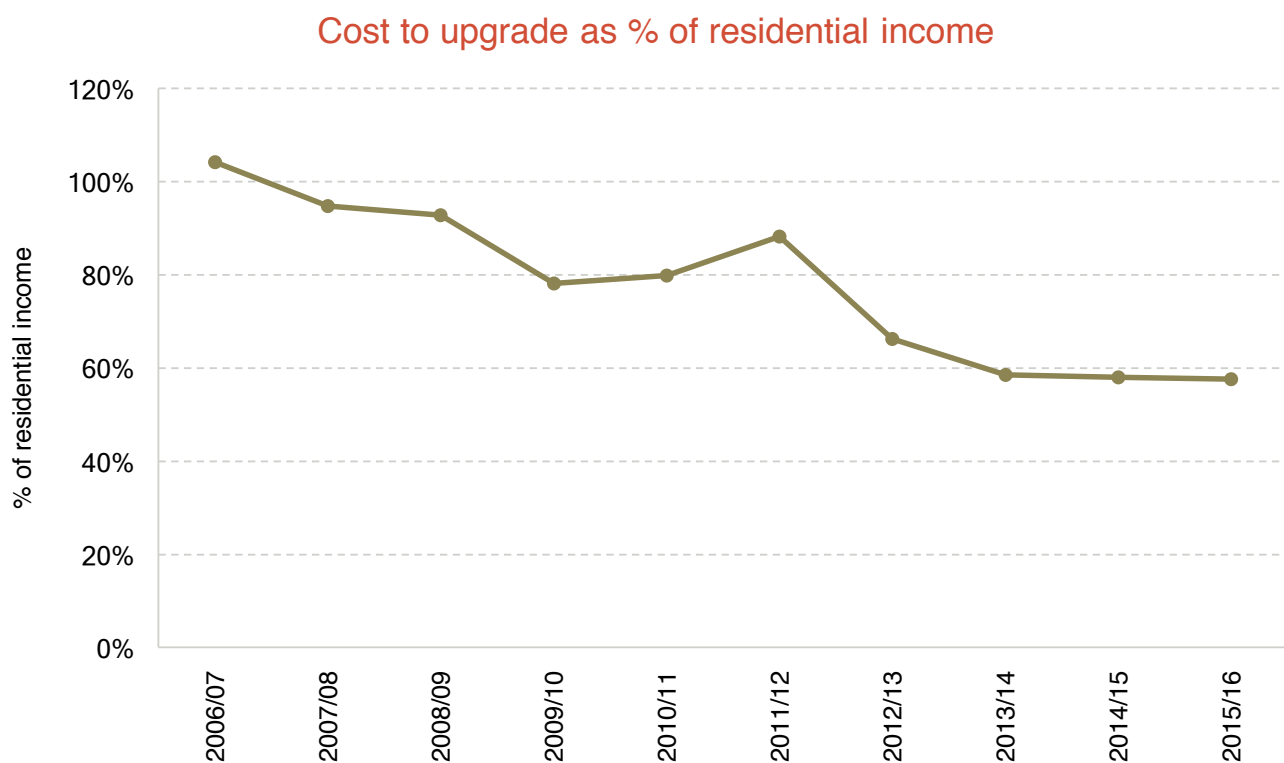
7.7. FUNCTIONAL SUITABILITY, PERCENTAGE IN GRADE 1, 2, 3 AND 4.



7.8. AGE, PERCENTAGE IN AGE BANDS.



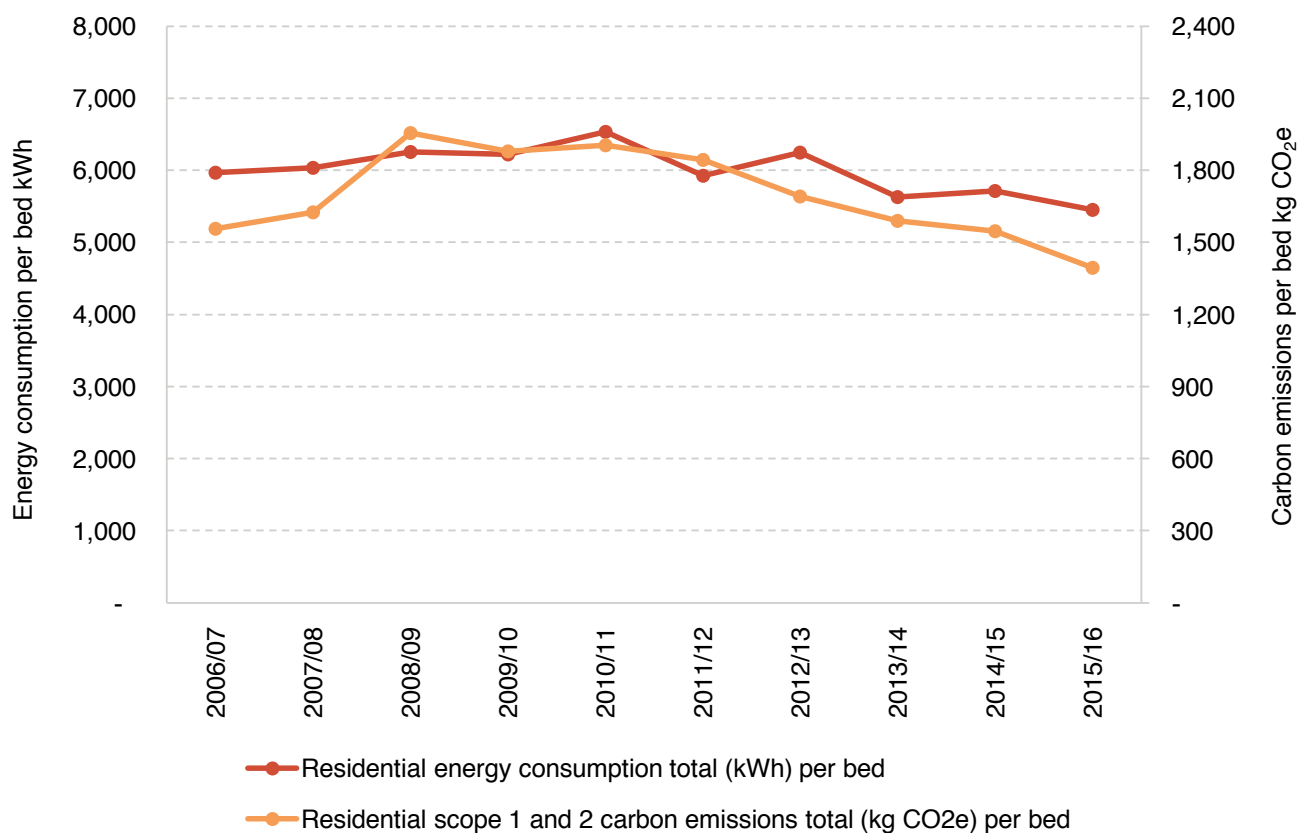
7.9. COST TO UPGRADE TO CONDITION B AS % OF RESIDENTIAL INCOME



*Calculation method: Residential building condition assessment cost to upgrade C & D to B (£) / Residences & catering income (£)

7.10. RESIDENTIAL ENERGY CONSUMPTION

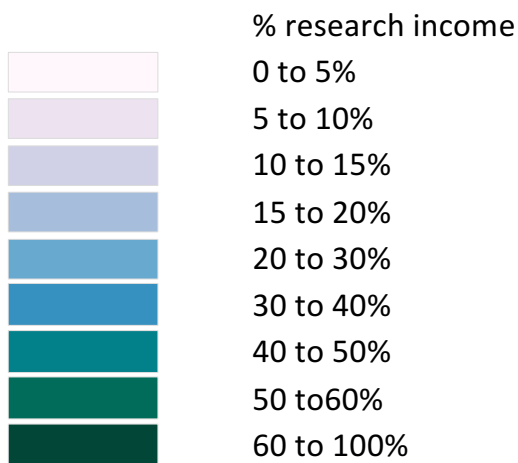
Residential energy consumption and emissions per bed



*Calculation method: 1. Residential energy consumption total (kWh)_y / Residential number of bed spaces_y, 2. Residential scope 1 & 2 carbon emissions total (kgCO₂e)_y / Residential number of bed spaces_y



The tree diagram shows the size of the academic income of each institution (i.e. teaching and research income) and the shading is determined by the % of the income generated by research.



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For more information visit www.aude.ac.uk/emr
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