Carbon Emissions in Higher Education

2020 Carbon Target Progress Report for the Academic Year 2014/15

September 2016

BriteGreen
Sustainable Strategy

Foreword

This is our third progress report on carbon reductions in the higher education sector in England. Through our independent analysis we aim to support practitioners and key decision makers in their efforts to reduce carbon emissions.

As in previous years, we have provided a rigorous and impartial review of carbon performance and trends in the sector, and have published updated league tables on emissions performance. We have also produced detailed reports for every university to give tailored benchmarks of their performance.

It is with great pleasure that we can announce that SOAS University of London tops the league table for absolute emissions reductions, having reduced their emissions by 54% since 2005. This is remarkable achievement. The Royal Agricultural University tops both emissions intensity performance tables demonstrating their strong commitment to energy efficiency.

This year we have also published a good practice guide for carbon emissions for the sector. The guide is designed to give practical advice and insights, and also includes detailed analysis of the challenges and opportunities for institutions.

The guide draws on key principles from management system standards, the results of our first higher education sustainability management survey, and interviews with managers from across the sector. We have included case studies and comments from practitioners from across the UK to explore the common challenges and to showcase the extraordinary work that is being done to drive performance.

The key challenge that universities face is the tension between commercial growth and emissions reductions.

Our research has charted the year on year growth in the sector but this year's report shows that universities have now reduced emissions by 10 per cent from the 2005 baseline. This is a great achievement especially against the backdrop of significant growth.

Our assessment also shows that the reductions made to date are well behind the rate needed to achieve the sector target of 43 per cent by 2020.

As well as the sector-wide trends, this year we have looked at research intensive universities in more detail. The 20 Russell Group institutions in England emit about half the emissions for the sector and face significant challenges to deliver reductions. There is some good work happening in these institutions and our sector survey and interviews have provided some great examples of innovation, particularly to address energy performance of labs.

As carbon management plans mature and universities become more commercial, many institutions are starting to look at the bigger sustainability picture. Universities face growing physical, financial and reputational risks related to climate change but there are also great opportunities. These opportunities include new courses and innovative learning models, including the exciting Living Labs project.

There are growing commercial opportunities for research and spin out technologies and universities need to take a strategic approach to manage these well. Many universities have taken a lead from the commercial sector and started to integrate their many sustainability initiatives into a single strategy that addresses commercial, academic and corporate responsibility areas.

The last 10 years have seen a huge step forward in carbon management in universities but there is still a lot of work to do. I am encouraged from our work and discussions with institutions over the past 12 months that there is the appetite and energy to deliver the ambitious carbon projects needed to tackle climate change effectively. I look forward to working with many of you in the coming months and years to achieve this.

Darren Chadwick

Managing Partner, Brite Green

About Brite Green

Brite Green is an award winning sustainability strategy consultancy. We specialise in delivering enhanced business value through improved sustainability performance.

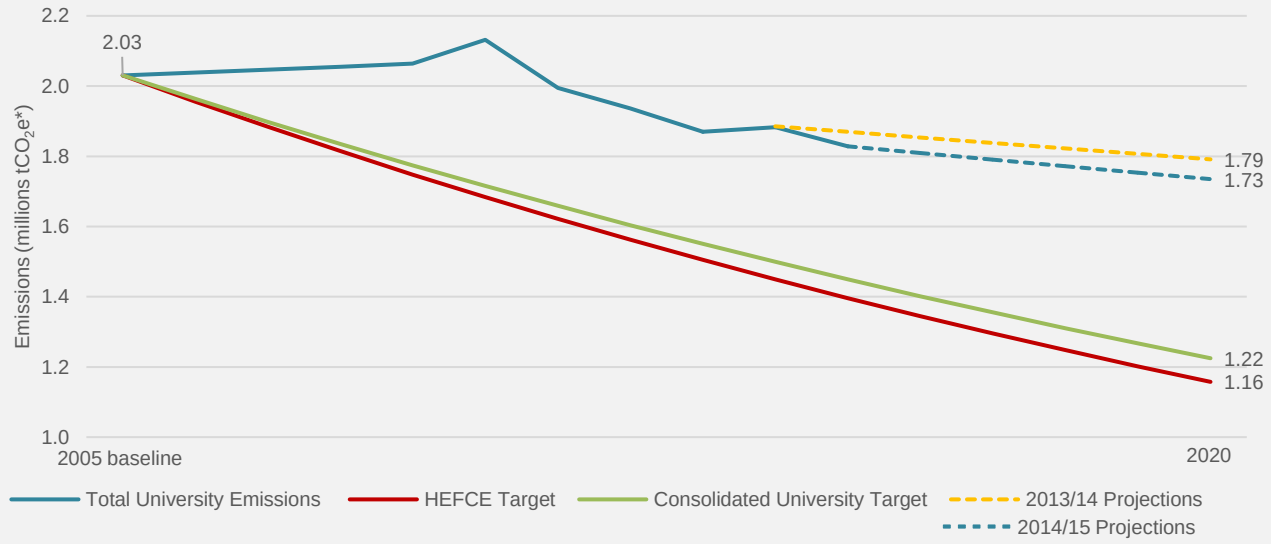
With a service offering that covers business strategy, management systems and solution implementation, Brite Green delivers business-focussed solutions that drive business performance.

We have considerable experience in carbon and environmental management in universities, including carbon management plan design and implementation.

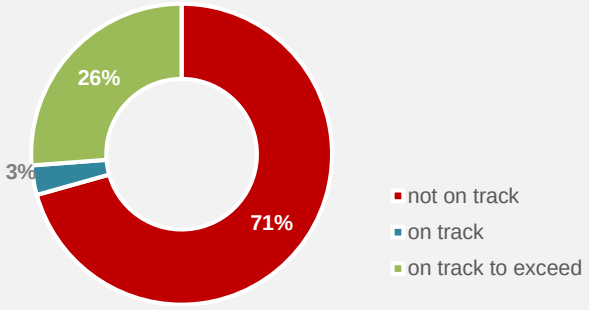
Universities reduce emissions by 10% over 10 years

Total emissions in English universities once again fell in 2014/15 to 1,828,394 tCO2e after a slight increase in 2013/14. Sector emissions are now 10% lower than the 2005 baseline.

If emissions continue to fall at the current rate, the sector may only achieve a 15% reduction by 2020 against the 2005 baseline.



71% of universities are not projected to meet their 2020 emissions target



Of the 126 universities analysed, only 37 are projected to meet or exceed their 2020 carbon reduction targets. The remaining 89 institutions will miss their targets.

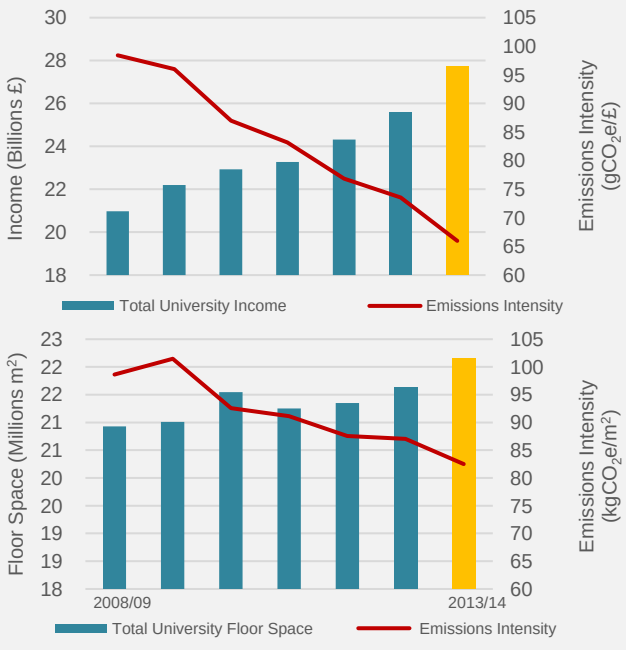
If institutions continue to reduce emissions in line with historical data, 71% of universities will not meet their emissions target.

Although 26% are projected to exceed their 2020 emissions targets, a third of those have reduced the initial targets set in 2008.

Compared to the last year's analysis, there have been a few minor changes in university performance. The number of universities projected to miss their targets has fallen by six: a slight improvement in carbon emissions reduction performance. The number of universities on track to exceed their targets increased by five, whilst the number of universities on track to meet their targets increased by one.

Overall, the sector improved its performace in 2014/15. This is likely a result of better overall energy mangement for the sector, as well as reduced carbon content in the country's energy mix for 2015.

Universities continue to improve efficiency within their estates, both in relation to income and floor area



The higher education sector has seen significant commercial growth over the last decade, both in terms of floor space and revenue. At the same time, effective energy management has led to a 10% decrease in total emissions, improving intensity measures significantly.

When measured against income (£), university emissions intensity has fallen by 33% since 2008 to 66 gCO_2e per £. When measured against floor space (m^2) university emissions intensity has fallen by 16% since 2008 to 83 $kgCO_2e$ per m^2.

There is a large gap between the top and bottom performers across all carbon metrics

The carbon performance of all English universities has been assessed in relation to absolute emissions and emissions relative to floor space and income.

The top and bottom performers are summarised here and full tables can be downloaded from our website.

Change in absolute emissions (tCO_2e)

	University	% change from 2005 to 2014/15
Decrease in emissions		
1	School of Oriental and African Studies	-54.99%
2	London Metropolitan University	-51.44%
3	University of Cumbria	-50.25%
4	City University	-47.92%
5	Rose Bruford College	-45.72%
6	Lancaster University	-45.71%
7	Buckinghamshire New University	-44.05%
8	University of Reading	-43.89%
9	University of Bradford	-41.28%
10	University of West London	-38.17%

	University	% change from 2005 to 2014/15
Increase in emissions		
117	University of Northumbria at Newcastle	17.75%
118	King's College London	21.19%
119	University of Derby	22.32%
120	Ldn School of Hygiene and Tropical Medicine	23.18%
121	University of the West of England	25.17%
122	University of Worcester	25.42%
123	Edge Hill University	32.28%
124	University of Bolton	55.17%
125	University of Chester	110.82%
126	Trinity Laban Conservatoire of Music & Dance	133.89%

Change in emissions intensity - income ($tCO_2e/£$)

	University	% change from 2008 to 2014/15
Decrease in emissions		
1	Royal Agricultural University	-60.80%
2	Aston University	-59.70%
3	University of Reading	-59.27%
4	School of Oriental and African Studies	-55.69%
5	King's College London	-55.66%
6	Norwich University of the Arts	-55.54%
7	University of Exeter	-50.77%
8	London Metropolitan University	-50.33%
9	Lancaster University	-50.10%
10	Courtauld Institute of Art	-49.50%

	University	% change from 2008 to 2014/15
Change in emissions		
111	Writtle College	-10.66%
112	University of Hertfordshire	-10.44%
113	University of Derby	-10.07%
114	Liverpool Hope University	-9.40%
115	University of the West of England	-7.99%
116	University of East London	-7.72%
117	University of Central Lancashire	-5.14%
118	Guildhall School of Music and Drama	20.69%
119	St George's Hospital Medical School	32.19%
120	University of Chester	56.79%

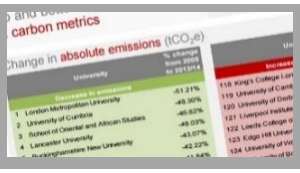
Change in emissions intensity - floor space (tCO_2e/m^2)

	University	% change from 2008 to 2014/15
Decrease in emissions		
1	Royal Agricultural University	-57.87%
2	School of Oriental and African Studies	-54.05%
3	London Metropolitan University	-47.38%
4	University of Chichester	-45.85%
5	University of Winchester	-45.53%
6	University of Greenwich	-41.50%
7	University for the Creative Arts	-38.47%
8	University of Southampton	-37.84%
9	King's College London	-37.56%
10	Lancaster University	-37.35%

	University	% change from 2008 to 2014/15
Increase in emissions		
111	Royal College of Music	3.01%
112	University of Central Lancashire	5.78%
113	Buckinghamshire New University	7.78%
114	Ldn School of Hygiene and Tropical Medicine	9.60%
115	Royal Veterinary College	16.21%
116	Guildhall School of Music and Drama	17.52%
117	University College London	18.13%
118	St George's Hospital Medical School	21.84%
119	University of Hertfordshire	30.79%
120	University of Chester	55.56%

Full Performance Tables and Institution Specific Reports

Detailed tables are available for all HEFCE funded universities. These can be requested from our website.

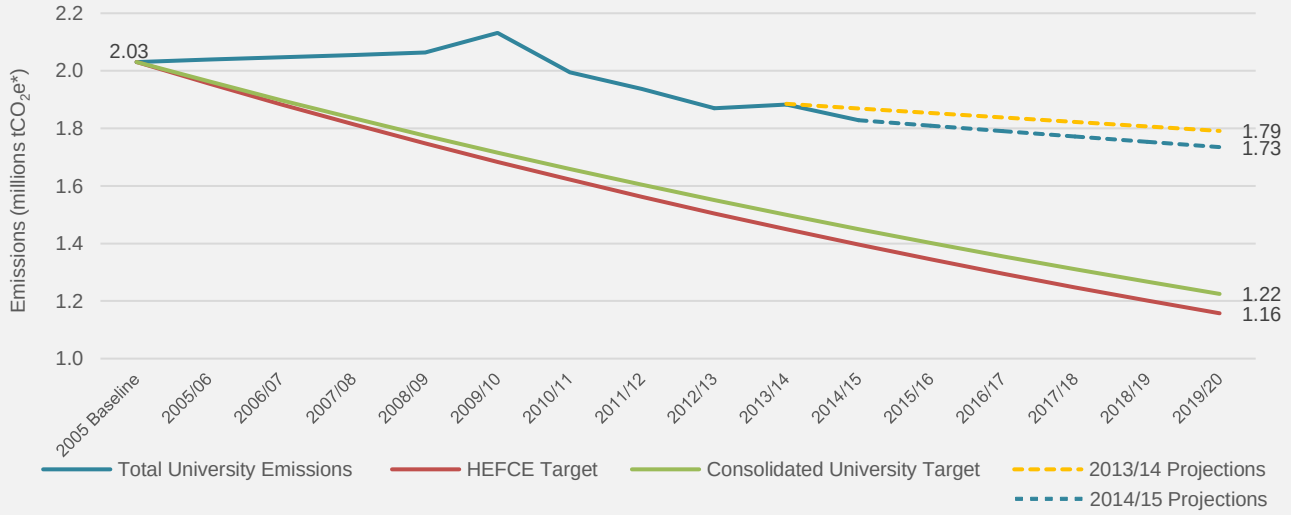


Total university emissions fall in 2014/15 but the sector is still off track

If emissions continue to fall at the current rate, the sector will only achieve a 15% reduction in 2020 against the 2005 baseline. This is just over a third of the HEFCE target.

Although the sector made an improvement in reducing emissions in 2014/15 compared to 2013/14, it is unlikely to meet its target.

Sector emissions and projections against targets



emissions in 2014/15 (tCO_2e)	emissions reduction (tCO_2e)	reduction from 2005	projected reduction by 2020
1,828,394	**54,432**	**10%**	**15%**

Total sector emissions fall in 2014/15

After an increase in emissions in 2013/14 emissions fell again in 2014/15 by 3% to 1,828,394 tCO2e.

Total sector emissions have fallen by 10% since 2005. Given the signficant commercial growth of the sector this is an impressive achievement. However, emissions are well behind the trajectory needed to achieve the 2020 reduction target of 43%.

If reductions continue their current trajectory, the sector will only achieve a 15% reduction by 2020 against the 2005 baseline.

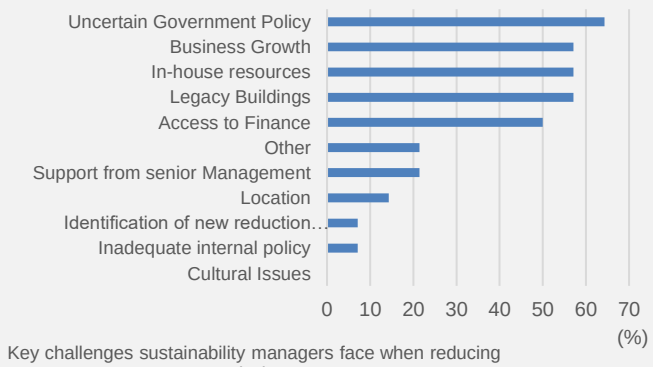
Top and bottom emitters

The University of Chester has had the largest increase in carbon emissions (9,242 tCO2e) from 2005 to 2014/15, the equivalent of 111% of total emissions in 2005. The institution almost doubled its emissions in 2014/2015.

The University of Birmingham has made the largest absolute reductions of 13,893 tCO_2e from 2005 to 2014/15, a change of 24%. It has managed to steadily decrease total emissions since 2009/2010.

Political uncertainty and balancing commercial growth with emissions targets are key reasons for universities falling behind targets

In a survey of sustainability managers across English universities, participants were asked to outline the key challenges universities face when reducing their emissions.



Key challenges sustainability managers face when reducing emissions

Universities face a number of common challenges when trying to manage their emissions. 64% of university sustainability managers see uncertain government policy as one of the biggest challenges to reducing carbon emissions.

57% of respondents found retrofiting legacy buildings, business growth and insufficient in-house resource as the biggest challenges.

Balancing commercial growth with reductions targets was highlighted as a critical challenge.

You can read more about the results of discussions with universities and key challenges for the sector in our ***Carbon Management in Higher Education Institutions: A good practice guide.***

*Emissions from 2008/09 to 2011/12 are in tCO2 and emissions from 2012/13 to 2014/15 are in tCO2e. The 2005 baseline is in tCO2e.
There are minor differences in the methodology for projections in the 2012/13 analysis & 2013/14 analysis. The 2014/15 analysis follows last year's report. This is set out in the Methodology Sheet.

The 20 Russell Group universities represent 50% of total emissions in the sector

In England, the Russell Group Universities have reduced their emissions by 4% from 2005 to 2014/15, significantly behind the sector average of 10%.

They represent 50% of total emissions for the sector, making this group of institutions critical in leading arbon reduction efforts.

Sector emissions in 2014/15 (tCO_2e)

1,828,394

Russel Group emissions in 2014/15 (tCO_2e)

917,938

The Russell Group universities represent a group of leading research intensive universities in the UK, 20 of these are based in England.

The 20 Russell Group universities in England account for 50% of total emissions across the sector, and their emissions reductions represent only 30% of total reductions to date. Given the nature and intensity of thier research the group faces unique challenges when reducing their emissions. Many run labs on a 24/7 basis and face location based constraints on the technologies they can implement to save energy.

Spotlight: Institution specific performance

Rank	Russell Group Universities in England	% change from 2005 to 2014/15
1	University of Birmingham	-24%
2	University of Leeds	-18%
3	University of Exeter	-16%
4	Imperial College London	-10%
5	University of Manchester	-8%
6	University of Durham	-7%
7	University of Bristol	-6%
8	Queen Mary University of London	-6%
9	University of Sheffield	-5%
10	University of Warwick	-4%
11	University of Nottingham	-3%
12	LSE	-1%
13	University of Newcastle	-0.38%
14	University of York	1%
15	University of Oxford	3%
16	University of Cambridge	5%
17	University of Southampton	5%
18	University College London	5%
19	University of Liverpool	7%
20	King's College London	21%

Emissions reductions across the Russell Group universities in England vary significantly by insitution.

The University of Birmingham is the top performer of the group, reducing its emissions by 24% since 2005. Of those Russell Group universities, it is also the only one projected to exceed its emissions reduction target. However it has one of the smallest targets of the sector at 20%.

None of the other Russell Group universities are projected to meet their emissions reduction targets if they follow their current trajectory.

The University College London has set the most ambitious reduction target of the Russell Group and the sector as a whole at 79%. This is a significant increase from its historical target of 34%. Since 2005, UCL has increased emissions by 5%.

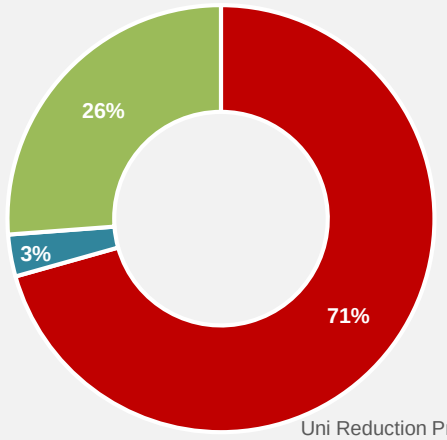
"The University has been an early adopter of low carbon technologies, our CHP plant came online in 2005. By this time we had already made upgrades to our lighting and had one of the most extensive and integrated Building Management Systems in the country covering the vast majority of our Estate. Our Automatic Metering System had also been established way back in 1997, well before most organisations had even heard of automatic metering and this now includes well over 200 meters collecting half hourly electricity, gas and water data right across the Estate – so we had already made progress in reducing our emissions well before the 2005/06 baseline year."

Kevin P Monaghan
Director of Estates and Facilities, Southampton University

71% of universities are not projected to meet their 2020 emissions target

Based on reduction trends to date carbon emissions have been forecast out to 2020 for each of the 126 HEFCE funded universities.

If universities continue to reduce emissions in line with historical data, over 70% of universities will not meet their emissions target.



Uni Reduction Projections

not on track
89

71% of the sector are not projected to meet their 2020 target.

on track to exceed
33

Although 26% are projected to exceed their targets, a third of those have reduced their 2020 emissions targets.

on track
4

Birkbeck College, Liverpool Hope Uni, Royal Academy of Music and the Uni of Sunderland are currently on track to meet their targets.

Insights from the sector

"It is extremely pleasing to see the University's carbon achievements recognised by an independent body such as Brite Green. It has been huge team effort over the last decade that seen a massive fall in carbon emissions from University activity. However, the journey is far from complete and 2016 has us implement further initiatives that will see the University improve its carbon reduction, not least having one of one of the first micro smart grids operational by the end of the year as our journey continues into a new era."

Russell Smith
Head of Estates, University of Bradford

"Compared with other higher education institutions, our energy consumption per square meter is relatively high because a large proportion of our estate is made up of laboratory space. Our labs need power 24 hours a day, 365 days per year, to keep our cancer research running – and their energy demands are much higher than standard office or lecture space.

Many of our buildings are relatively new and built to modern building regulations, which means making further reductions is challenging and costly. We also have an ambitious ongoing expansion plan to build more laboratories. Last year we launched our Centre for Cancer Imaging, which is already leading to vital new discoveries about cancer, but has partially offset some of the gains we made in reducing our energy use."

Steve Surridge
Director of Operations, The Institute of Cancer Research

Changes to university targets

2013/14 results	2014/15 results
reduced target	reduced target
29	**33**
increased target	increased target
23	**25**
not changed target	not changed target
75	**68**

Comparisons of carbon reduction targets initially published by HEFCE with the latest reduction targets in the 2014/15 HESA estates management record (EMR) show that 26% of universities have reduced their targets since they were first set whilst 20% have increased theirs.

Compared to the 2013/14 analysis there have been a few minor changes in university targets. This year, an additional four universities have reduced their emissions targets taking the number to 33; 25 universities have increased their target, two more than last year demonstrating a commitment from some institutions to go beyond their initial ambitions. The target remained unchanged for 54% of English universities.

Of those universities that have increased their 2020 targets, five have already surpassed their initial targets and are now aiming to further improve carbon reductions.

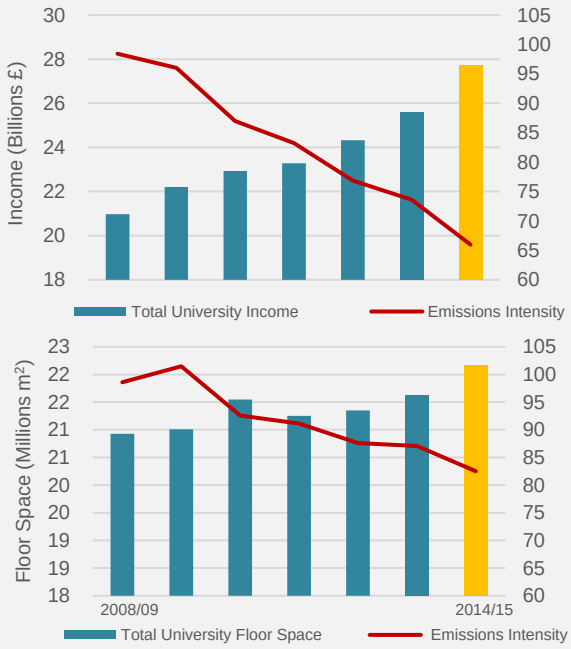
Twenty-one intitutions have set out larger ambitious targets for carbon reductions, but are not on track to meet them.

Efficiency

Universities continue to improve efficiency within their estates, both in relation to income and floor area

Sector income and floor area have been increasing steadily since 2008/09, putting upward pressure on absolute emissions.

Universities have, however, improved efficiency within their estates, both in relation to income and floor area.



Commercial Growth

University sector income has grown by 32% from 2008 to 2014/15. Similarly, floor space (m^2) has grown by 6% from 2008 to 2014/15.

Long Term Efficiency

An analysis of emissions in relation to revenue and floor area show that rising incomes and floor area have not resulted in an equivalent increase in emissions. Since 2008, university emissions intensity has fallen by 33% when measured against income (£) and 16% when measured against floor area (m^2).

Recommendations

We have four recommendations to help improve carbon management performance:

Review your performance

Once you have undertaken a comprehensive review of your energy and carbon management measures analyse emissions performance to date. Assess the impact of commercial growth on carbon performance. Check which initiatives implemented to date have achieved the expected reductions.

Benchmark against peers and best practice

Limited resources and increased complexity are inherent in energy and carbon management within any organisation. To help in addressing both skills and resource gaps and to use existing ones more efficiently, benchmark against peers and best practice. Also use external support to enhance performance by helping you recognise areas previously overlooked.

Identify areas for improvement

Periodically review what additional energy and carbon reductions opportunities are available to you. Update your carbon reduction programme when appropriate.

Upgrade to an integrated sutainbility strategy

Review and update the business case for sustainability, including the financial, commercial and reputational drivers and risks. This may include revising the commercial case for carbon abatement initiatives and opportunities for new revenue streams or funding.

Align your commercial, carbon and sustainability strategies. Collaborate across the institution to develop realistic targets that are aligned with business growth objectives.

As universities become more complex, and as the 'low-hanging fruit' of carbon reduction opportunities are addressed, the need for cross-departmental collaboration becomes more apparent. Sustainability measures across all areas of the institution yield much bigger results for improved performance.

You can read more about the results of discussions with universities and key challenges for the sector in our ***Carbon Management in Higher Education Institutions: A good practice guide*** .

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Sustainable Strategy

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To find out more about Brite Green's services, please contact us.