

Developing a Carbon Accountability Scheme for UCL

In 2016, the University College London (UCL) published its updated Carbon Management Plan, Degrees of Change, which set out how to reduce carbon emissions and identified key targets and milestones. The plan included a commitment to develop and implement financial incentives for departments to reduce their environmental impact.

The working group charged with designing the incentives ultimately devised the UCL Carbon Accountability Scheme, which will charge departments roughly £30, or \$40, per tonne of carbon emitted. (The precise figure is yet to be decided.) The scheme will measure departments' scope 1 and 2 carbon emissions and apply a charge or a rebate based on performance relative to an overall institutional target for carbon reduction. Scope 3 emissions from procurement and business and academic travel will be reported, but not (initially) included in the charging mechanism. Along with an annual charge or rebate, information on emissions from buildings and operations, procurement, and academic travel will be provided to departments each term.

The pilot of the program, which includes ten departments where good metering is available, will start in the 2018-19 academic year. Results will be used to refine the mechanism for a proposed university-wide launch in the 2019-20 academic year

The following document provides an outline of the development and design of the pilot.

Contents

1. Scope of carbon covered	2
2. Buildings covered	2
3. Charging mechanism	2
4. Target setting	3
5. Baseline from which targets are calculated	3
6. Cost of carbon	4
7. Departments that share buildings with other departments	4
8. Dispensation for changes in circumstance	4
9. Accounting for shared facilities	5
10. Presentation of the data to departments	5
11. Mechanism for payments from and to departments	6
12. What happens to the rebates?	6
13. How are carbon savings achieved?	7
14. Additional support provided	7
15. Establishing the pilot	7
16. Proposed next steps	8
17. Appendix A: Demonstration of different targets and carbon prices applied to the pilot departments	9
18. Appendix B: Choosing a Charging mechanism	13

1. Scope of carbon covered

Scope 1 and 2 emissions (i.e. carbon resulting from electricity and heating fuels used in buildings and UCL's directly owned fleet vehicles) will be reported at a departmental level. Any charges or rebates will be calculated using these emissions.

Scope 3 emissions from business travel will also be included in the scheme. These emissions are currently covered under an existing travel carbon-offset scheme, which will be made more transparent. We hope that including these emissions will make the scheme more relatable, as choices around whether and how to travel are often within an individual's control far more than the design and operation of buildings.

Scope 3 emissions from the manufacture of goods purchased, waste produced, and water consumption will be reported at a departmental level but not included in any charging mechanism.

2. Buildings covered

The pilot stage will begin in around a dozen departments representing a cross-section of UCL research and teaching. Following the pilot, the accountability scheme will cover all UCL academic and professional services departments.

Residential buildings will be excluded from the charging mechanism but included in the reporting—they currently pay for their own energy use and so are incentivised to reduce it.

UCL occupies a number of buildings owned by others in which occupancy is low and separate meters have not been installed. It has been proposed that these spaces be assessed on a case-by-case basis to determine the benefit of installing metering to calculate energy consumption. These buildings account for around 4% of UCL's total floor area.

3. Charging mechanism

The scheme proposes a target charging mechanism for the Scope 1 and 2 carbon emissions. The diagram below (Fig. 1) demonstrates how this worked at Yale University, where each department is compared to a 1% reduction target. The difference between the actual and target emissions of each building determines whether the department incurs a charge or receives a rebate.

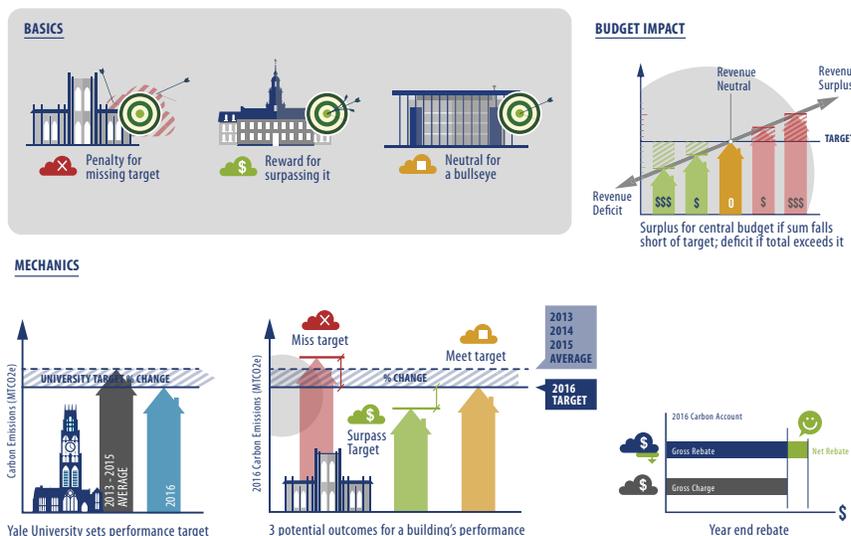


Figure 1 Target Model

Of the different mechanisms considered, this one is the simplest to explain to departments, provides the greatest perception of fairness, and is flexible regarding exclusions for special cases/appeals.

The sum of charges and rebates is not zero by design, potentially subjecting the UCL estates department to a surplus or deficit, although any deficit would likely to be outweighed by the energy bill savings. (See the Risks section below for more detail.)

Further information about the different scheme designs considered is provided in Appendix B.

Outstanding questions:

- How to deal with Scope 3 business travel: should that have its own target?

4. Target setting

Research suggests that if departments have a say in the setting of the target they are more likely to be invested in meeting it. It was therefore proposed that the pilot include consultation with participating departments about an appropriate target. This will help to ensure the correct balance of aspiration and achievability.

The target must be relatable to UCL's overall target for carbon reduction: 15% by 2020. Given this, a 2% year-on-year reduction would be a good starting point for discussion.

It should be noted that for some departments the carbon incentives may seem quite small relative to income. It can thus be argued that either a high carbon price or a high target is required to incentivise action. However, such a scheme would not be likely to gain approval.

Outstanding questions

- Should we set different targets for more energy intensive buildings/departments?
- Is there a potential to reward departments for setting a high target?

5. Baseline from which targets are calculated

Energy consumption baseline

Yale used a 3-year average. UCL's energy data is most complete for the 2016-17 and 2017-18 academic years, but for some departments (such as those with changes in size or location), a single year would likely be the most accurate baseline. For departments that have made energy reduction changes in earlier years, a different baseline should likely be chosen to ensure incentives for further reductions remain.

Carbon baseline

There will be a natural reduction in carbon emissions from annual grid decarbonisation. This has been significant in recent years, with a 10% drop between 2014-15 and 2015-16, a 15% drop between 2015-16 and 2016-17, and a 19% drop between 2016-17 and 2017-18. In order to highlight the effect of actions taken by departments, comparisons between years will use a single carbon factor and will not include the extra effects of grid decarbonisation.

We propose the most current Department of Environment, Food & Rural Affairs (DEFRA) Greenhouse Gas conversion factor to calculate carbon emissions from energy used. This means the current-year departmental carbon emissions would relate directly to UCL's overall current emissions. Baseline-year carbon emissions, meanwhile, would be updated using the latest carbon factor, so they would not match

previous reported totals. Appendix A shows the effect of four different carbon reduction targets (1%, 2%, 5%, and 6%) for the pilot departments.

Outstanding questions:

- What would be the best way to consult pilot departments about the target?
- Should data be normalised to account for colder winters or hotter summers?

6. Cost of carbon

Yale used a “social cost of carbon” of \$40/tonne, rising 3% each year for inflation.

In the UK, the Carbon Reduction Commitment (CRC) scheme cost is £17.20/tonne rising with inflation. However, the CRC scheme ends in 2019; it will be replaced with increased Climate Change Levy (CCL) charges collected directly through bills. CCL rates will be equivalent to around £30 per tonne rising with inflation (CCL is charge per kWh energy used rather than directly on carbon emissions). Given CRC and the EU Emissions Trading scheme are not likely to be in existence after the first year of the UCL scheme, we propose that the cost of carbon be at least equivalent to the CCL rate.

For UCL, the energy cost associated with a tonne of CO₂ is around £250. (That is, this would be the amount saved by not consuming the energy that contributes to emitting a tonne of CO₂). This suggests that the cost of rewarding departments for reducing consumption should be less than the savings to the centre; the scheme would therefore be self-funding.

The three prices per tonne of carbon listed above have been modelled for the pilot departments. Appendix A shows the effect of the different carbon prices for the pilot departments.

Outstanding questions:

- How do we ensure that the carbon price does not outweigh income for energy-intensive departments? Should there be a cap?

7. Departments that share buildings with other departments

A number of buildings contain both laboratory or clinical spaces and office or teaching spaces. However, metering is generally only available at a building level. When buildings are shared between departments, energy intensity factors for the different types of use will be applied to provide an ‘energy weighting’, thereby attributing fair energy use to the respective departments. (This tool is being developed with the UCL Energy Institute).

Transparency around factors and how they are calculated is important for the scheme’s perceived fairness. This information could be published on a webpage.

8. Dispensation for changes in circumstance

Departmental growth will also need to be accommodated. If a department moves or adds to its space, the extra associated carbon could be excluded from reporting and charging until at least one year into occupancy to enable baseline development. These additional emissions would then be added to the baseline carbon emissions for the department and a new target reduction set.

An appeals process could be in place to allow departments to change their target should there be a change in circumstance, like the purchase of a major new piece of equipment or an increase in occupant density.

Outstanding questions

- How would the appeals process work?

9. Accounting for shared facilities

A number of buildings contain facilities that are shared between different departments. Given the high-energy use of these buildings it is important that the carbon emissions are fairly accounted for.

Animal housing Main animal houses have their own metering and so could be charged directly to the Biological Services Administrative Unit, which could then cross-charge user departments as it sees fit. There are also small animal houses that are managed by departments; these would be included within departmental calculations.

Data centres Dedicated data centres are metered. These could be charged centrally to the Information Systems Division (ISD) or cross-charged to departments based on usage. Small data and server rooms that are managed by departments will be included in departmental calculations.

Lecture theatres These are centrally bookable by many different departments. It has been proposed that carbon emissions be attributed to the floor area of lecture theatres and then removed and not charged to any department. Seminar rooms could be treated in the same way, but further investigation is required to understand how much departments not based in the building use these.

Corridors and plant rooms These would be excluded from the building area and, in effect, redistributed among occupying departments.

Animal housing and data centres will be excluded in the pilot, as none of the participating departments have these facilities.

10. Presentation of the data to departments

Emissions data will initially be shown through a Tableau dashboard for Heads of Departments, (with a live data display available for all staff and students through a new energy management platform, similar to the [Carbon Culture system](#)).

A link could then be emailed to each department on a monthly basis showing current carbon performance alongside charges or rebates; something similar is done for Print@UCL.

An aggregated version of the data would be presented at the Estates Boards for each School.

Comparison

Research also shows that comparing performance to others drives behaviour change. Comparisons are more effective if:

- They are fair (e.g. a chemistry building is compared to another chemistry building);
- There are multiple points of comparison. For example: Is the department on track to meet the target? Is there a saving compared to the last report? How is the department doing next to other departments?

These comparators would be included when presenting feedback to departments. Data would also be presented in terms of carbon emissions per meter-squared (m²) and per full-time-equivalent (FTE).

A leaderboard could show the best and worst performing departments. This would be based on the relative carbon emissions (per m² or per FTE) to make it more comparable.

Improving performance

Monthly reports will also include clear and tailored advice on how to reduce carbon emissions.

Pilot testing of feedback

The pilot proposes trials to probe the efficacy of different methods for communicating performance to departments (and staff and students within the department). These include:

- Frequency of feedback. Research shows that there needs to be a balance between providing regular feedback and allowing time for changes to be made (and measured).
- What format is best for providing feedback? Display screens, websites, tableau?
- Messaging for different audiences. For instance, financial incentives for heads of departments and carbon savings for staff.
- Feedback on actions taken, as well as results.

Outstanding questions:

- Should the total cost of carbon emitted by a department also be shown, with the charge or rebate element separate? This would lead to bigger numbers being displayed.
- How else should we communicate departmental performance?

11. Mechanism for payments from and to departments

Payment and rebate will be done as a journal by the financial accounting team in central finance. The current carbon offset scheme for flights is done in this way on a quarterly basis; this could be replaced by a joint carbon accountability charge/rebate.

The scheme will need to sit within the estates budget in order to cover the risk with utilities savings.

Quarterly reporting will need to be provided to allow departments to forecast correctly for F1 and F2 reporting periods.

Outstanding questions:

- How to treat the faculty offices in the scheme: do they have any budget?

12. What happens to the rebates?

The pilot proposes splitting buildings into two groups to test different measures:

1. All the rebates are returned to the department.
2. 50% of the rebate is returned to the department and 50% of the rebate is used for some form of staff/student reward.

Revenue made by UCL from departments that have increased their carbon emissions are set aside for a carbon saving fund. Departments could bid into the fund with carbon saving ideas, supplementing the existing funding that is available for energy efficiency and administered by estates.

Outstanding questions:

- What could the staff/student reward be?

13. How are carbon savings achieved?

It is envisaged that carbon savings would mostly be achieved by behavioural changes within departments: switching equipment off, ensuring heating and cooling is in line with UCL's Heating and Cooling Policy, and purchasing energy efficient equipment. However, there may be instances where departments identify capital expenditure projects, such as LED lighting replacements, that would reduce their carbon emissions. These would need to be delivered by estates, and it is likely that such projects would also need to be funded by estates.

Outstanding questions:

- For departments that have received projects funded by estates, what is the best mechanism for splitting carbon savings between estates and the department?

14. Additional support provided

In order to help departments reduce their carbon emissions we propose providing support alongside the carbon pricing. This could take the following forms:

- Surplus generated from the carbon pricing could feed into a funding pot that departments bid into with energy efficiency ideas. This could supplement the existing funding available for energy efficiency, which is administered by estates.
- An 'advice service' in which UCL Sustainability surveys departmental practices and makes suggestions for carbon reductions.
- For the departments in the pilot, the Energy Institute could offer an energy fingerprinting survey to help understand where energy is being used, thereby providing guidance on how to reduce it.
- A network of "Carbon Champions" with responsibility for action in their departments; this group could also share best practice across the institution.
- Toolkit of advice and resources available to departments

Outstanding questions:

- What other support could be provided to departments to promote carbon savings?

15. Establishing the pilot

The following departments have been identified as possibilities in the pilot. These would provide a good spread of activities across UCL, have good metering data available, and are likely to support the scheme:

- Bartlett School of Environment, Energy & Resources
- Bartlett School of Architecture
- Cancer Institute
- Chemical Engineering
- Chemistry
- Civil, Environmental & Geomatic Engineering
- Department of Geography
- Division of Psychology & Language Sciences
- Division of Biosciences
- Institute of Archaeology

- Institute of Ophthalmology
- School of Pharmacy
- Slade School of Fine Art
- SSEES (School of Slavonic & East European Studies)
- Institute of Child Health
- UCL Estates

Appendix A demonstrates the impact of different carbon price points and reduction targets on rebates/charges to departments. This shows that, based on 2016-17 data, anything higher than a 2% target would mean that nearly all departments would be making payments into the scheme rather than receiving a rebate. A higher target may therefore be a challenging sell to departments.

Outstanding questions:

- What are the key variables to test in a pilot?

16. Proposed next steps

1. Refine pilot programme rules;
2. Approach departments to see if they would be willing to take part in the scheme in principle. (Maximum likely budget exposure would need to be clearly articulated);
3. Sign off from Senior Management Team, estates, and finance for the pilot to go ahead;
4. Outline resources and support available;
5. Pilot to be administered by UCL Sustainability team with support and guidance from working group

Outstanding questions

- How long should the pilot last?
- What other consultation would be beneficial? Yale held a Town Hall meeting, a conference with carbon pricing experts, and had a competition for ideas.

17. Appendix A: Demonstration of different targets and carbon prices applied to the pilot departments

Targets are departmental performance relative to the baseline year 2015-16, with the same carbon factor applied to each year. This reflects genuine reductions in departmental energy use. (A negative value is a rebate to a department and a positive value is a charge to a department.)

TABLE 1: 1% CARBON TARGET

Department	Co2 vs target	Charge/rebate £17.20/tonne	Charge/rebate £30/tonne	Charge/rebate £250/tonne
PSYCHOLOGY & LANGUAGE SCIENCES	-4.9%	-£448	-£782	-£6,514
DIVISION OF BIOSCIENCES	-3.0%	-£210	-£367	-£3,054
SLADE SCHOOL OF FINE ART	-1.9%	-£83	-£144	-£1,199
GEOGRAPHY	-0.5%	£33	£58	£484
CIVIL, ENVIRONMENTAL & GEOMATIC ENGINEERING	0.3%	£92	£161	£1,341
SSEES	0.6%	£27	£47	£392
CANCER INSTITUTE	0.8%	£778	£1,357	£11,305
SCHOOL OF ARCHITECTURE	2.2%	£265	£463	£3,856
CHEMICAL ENGINEERING	3.0%	£692	£1,207	£10,061
CHEMISTRY	3.6%	£1,852	£3,231	£26,921
SCHOOL OF PHARMACY	7.8%	£2,249	£3,923	£32,693
INSTITUTE OF OPHTHALMOLOGY	8.0%	£2,400	£4,186	£34,881
INSTITUTE OF ARCHAEOLOGY	8.5%	£525	£915	£7,626
SCHOOL OF ENVIRONMENT, ENERGY & RESOURCES	9.7%	£384	£669	£5,575
INSTITUTE OF CHILD HEALTH	12.5%	£4,354	£7,594	£63,281

TABLE 2: 2% CARBON TARGET

Department	Co2 vs target	Charge/rebate £17.20/tonne	Charge/rebate £30/tonne	Charge/rebate £250/tonne
PSYCHOLOGY & LANGUAGE SCIENCES	-4.9%	-£333	-£580	-£4,834
DIVISION OF BIOSCIENCES	-3.0%	-£103	-£180	-£1,504
SLADE SCHOOL OF FINE ART	-1.9%	£5	£8	£67
GEOGRAPHY	-0.5%	£94	£165	£1,373
CIVIL, ENVIRONMENTAL & GEOMATIC ENGINEERING	0.3%	£162	£282	£2,348
SSEES	0.6%	£44	£76	£633
CANCER INSTITUTE	0.8%	£1,199	£2,092	£17,432
SCHOOL OF ARCHITECTURE	2.2%	£348	£607	£5,062
CHEMICAL ENGINEERING	3.0%	£867	£1,512	£12,603
CHEMISTRY	3.6%	£2,258	£3,939	£32,822
SCHOOL OF PHARMACY	7.8%	£2,503	£4,367	£36,388
INSTITUTE OF OPHTHALMOLOGY	8.0%	£2,665	£4,649	£38,741
INSTITUTE OF ARCHAEOLOGY	8.5%	£580	£1,012	£8,431
SCHOOL OF ENVIRONMENT, ENERGY & RESOURCES	9.7%	£419	£732	£6,097
INSTITUTE OF CHILD HEALTH	12.5%	£4,676	£8,155	£67,962

TABLE 3: 5% CARBON TARGET

Department	Co2 vs target	Charge/rebate £17.20/tonne	Charge/rebate £30/tonne	Charge/rebate £250/tonne
PSYCHOLOGY & LANGUAGE SCIENCES	-4.9%	£14	£25	£205
DIVISION OF BIOSCIENCES	-3.0%	£216	£378	£3,147
SLADE SCHOOL OF FINE ART	-1.9%	£266	£464	£3,866
GEOGRAPHY	-0.5%	£278	£485	£4,040
CIVIL, ENVIRONMENTAL & GEOMATIC ENGINEERING	0.3%	£369	£644	£5,369
SSEES	0.6%	£93	£163	£1,355
CANCER INSTITUTE	0.8%	£2,464	£4,297	£35,811
SCHOOL OF ARCHITECTURE	2.2%	£597	£1,042	£8,682
CHEMICAL ENGINEERING	3.0%	£1,392	£2,428	£20,229
CHEMISTRY	3.6%	£3,476	£6,063	£50,524
SCHOOL OF PHARMACY	7.8%	£3,266	£5,697	£47,472
INSTITUTE OF OPHTHALMOLOGY	8.0%	£3,462	£6,038	£50,320
INSTITUTE OF ARCHAEOLOGY	8.5%	£746	£1,302	£10,847
SCHOOL OF ENVIRONMENT, ENERGY & RESOURCES	9.7%	£527	£920	£7,663
INSTITUTE OF CHILD HEALTH	12.5%	£5,642	£9,841	£82,006

TABLE 4: 6% CARBON TARGET

Department	Co2 vs target	Charge/rebate £17.20/tonne	Charge/rebate £30/tonne	Charge/rebate £250/tonne
PSYCHOLOGY & LANGUAGE SCIENCES	-4.9%	£130	£226	£1,885
DIVISION OF BIOSCIENCES	-3.0%	£323	£564	£4,697
SLADE SCHOOL OF FINE ART	-1.9%	£353	£616	£5,133
GEOGRAPHY	-0.5%	£339	£591	£4,929
CIVIL, ENVIRONMENTAL & GEOMATIC ENGINEERING	0.3%	£439	£765	£6,376
SSEES	0.6%	£110	£191	£1,595
CANCER INSTITUTE	0.8%	£2,885	£5,033	£41,938
SCHOOL OF ARCHITECTURE	2.2%	£680	£1,187	£9,888
CHEMICAL ENGINEERING	3.0%	£1,567	£2,733	£22,771
CHEMISTRY	3.6%	£3,882	£6,771	£56,424
SCHOOL OF PHARMACY	7.8%	£3,520	£6,140	£51,166
INSTITUTE OF OPHTHALMOLOGY	8.0%	£3,728	£6,502	£54,180
INSTITUTE OF ARCHAEOLOGY	8.5%	£802	£1,398	£11,652
SCHOOL OF ENVIRONMENT, ENERGY & RESOURCES	9.7%	£563	£982	£8,185
INSTITUTE OF CHILD HEALTH	12.5%	£5,964	£10,403	£86,688

18. Appendix B: Choosing a charging mechanism

Yale completed a six-month pilot that involved 20 university buildings and it looked at a variety of mechanisms for carbon pricing. Based on the success of this work, it is now expanding the scheme to 60 buildings. Four mechanisms were piloted:

1. Providing information on carbon performance;
2. Setting a target carbon reduction level. Buildings were fined or paid \$40 per metric ton of carbon dioxide equivalent depending on whether emissions were above or below that target;
3. Redistribution. Buildings were provided rebates or incurred charges based on their performance compared to other buildings. Their target in effect becomes the equivalent of UCL's overall carbon reduction;
4. Investment. Buildings received 20% of their baseline carbon charge for spending on self-guided energy actions.

The following report from Yale provides further information about the success of the four different carbon-pricing schemes piloted: https://carbon.yale.edu/sites/default/files/files/Carbon_Charge_Pilot_Report_20161010.pdf

Options two and three were most successful, leading to an average 10% reduction in carbon emissions. These schemes are outlined below alongside a table highlighting the pros and cons of each approach.

Yale worked out that 3.48% of total expenses were for energy. For UCL this figure is 2.7%. As UCL is spread across such a large estate, many buildings contain just a few rooms from a department.

Redistribution-based approach

The diagram below (Figure 2) demonstrates the mechanics of Yale's redistributive approach, in which a building's baseline is adjusted by the group's overall percentage change in emissions. The difference between that building's actual and adjusted baseline emissions determines whether they incur a charge or receive a rebate. The sum of charges and rebates is zero, making this scheme revenue-neutral.

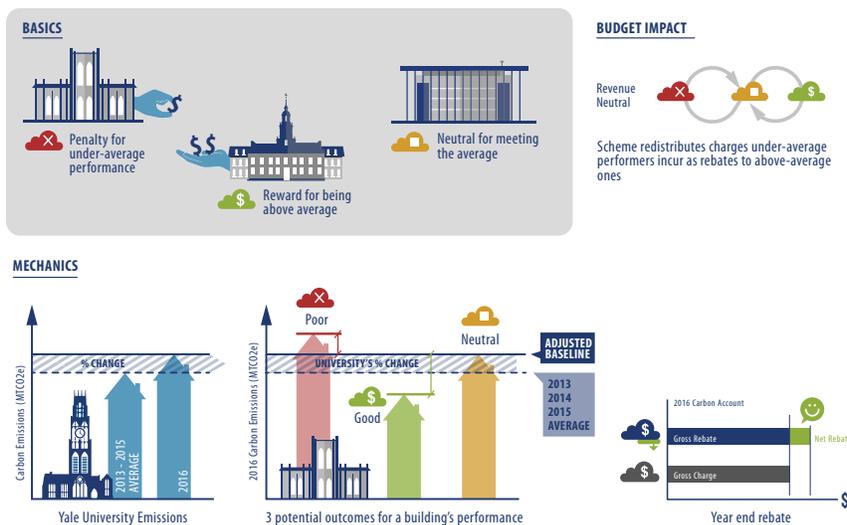


Figure 2 Redistribution Model

Target-based approach

Below is the diagram (Figure 3) demonstrating the mechanics of Yale’s target-based approach, in which a building is compared to a 1% reduction target. The difference between actual and target emissions of a building determines whether it incurs a charge or receives a rebate. The sum of charges and rebates is not zero by design, potentially subjecting the university to a surplus or deficit (although this would likely to be outweighed by the energy bill savings).

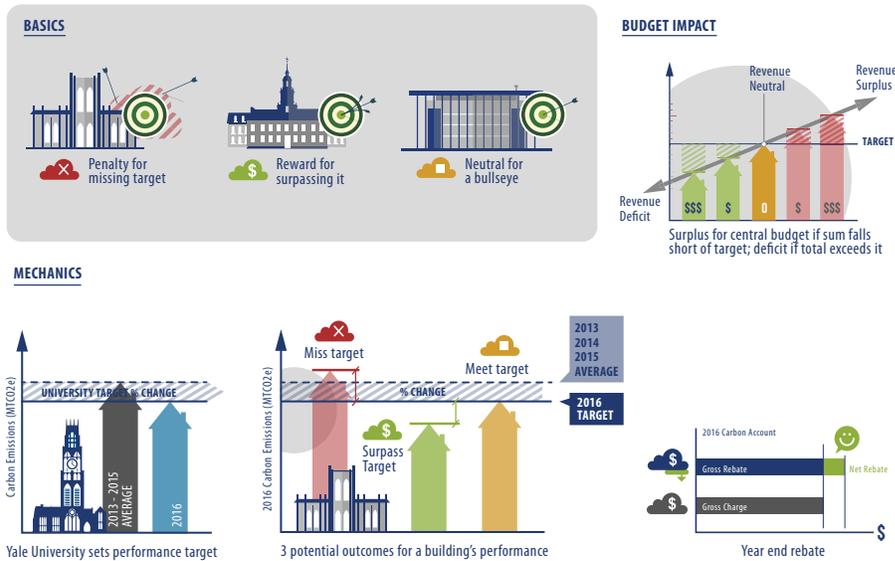


Figure 3 Target Model

Below is a table (Figure 4) outlining the pros and cons of the revenue-neutral and target-based schemes piloted by Yale.

	Pros	Cons
Scheme 3 (Redistribution)	<ul style="list-style-type: none"> • <i>Value in Cost Certainty:</i> Revenue-neutrality provides cost certainty • <i>Not a Tax to Raise Revenue:</i> Revenue-neutrality avoids appearance of tax on self-supports • <i>Unpredictable as an Upside:</i> Lack of predictability may be motivating • <i>Reducing Isn't Chasing Tails:</i> While reducing may lower the average, a unit still reaps most of the benefit of their reduction • <i>Policy Implications:</i> Revenue-neutrality may be a cornerstone of effective carbon pricing policy 	<ul style="list-style-type: none"> • <i>Cost Certainty for One, not All:</i> The scheme may be revenue neutral for the university, but it is not for the units • <i>Theoretically Motivating, Practically Paralyzing:</i> A moving average may make performance prediction difficult and real-time cost-benefit analysis difficult • <i>Uneven Playing Field:</i> Comparison to an average may unfairly penalize early-adopters while benefitting late-adopters • <i>The Price Isn't Right:</i> REP schemes result in net carbon prices that are lower than the original carbon price post-return • <i>Rewards for Growth:</i> If university emissions grow, units increasing at slower-than-average rates earn rewards despite growth • <i>Baselines Are Burdensome:</i> Percent change calculations require baselines, which are controversial and subject to gaming
Scheme 2 (Target)	<ul style="list-style-type: none"> • <i>Predictability as an Upside for Units:</i> Targets may be more actionable than an average by offering predictable cost-benefit accounting • <i>Reduction or Payment:</i> A target acts like a cap, ensuring reduction or pollution payment • <i>Individual Focus:</i> Targets focus competition internally, which may be more motivating and fairer than Scheme 1 • <i>Customization as an Option:</i> Ability to customize targets offers flexibility 	<ul style="list-style-type: none"> • <i>Cost Certainty Isn't Assured:</i> Targets with linear payment functions subject the university to a potential deficit or surplus • <i>Targets and Baselines are Burdensome:</i> Targets, which also require baselines, are controversial and gameable, especially if they are custom and not universal • <i>Again, the Price Isn't Right:</i> Refunded Emissions Payment schemes—whether based on averages or targets—result in marginal carbon prices that are lower than the original carbon price after the return

Figure 4 Pros and Cons of models considered by Yale