Committee:	Date:
Efficiency and Performance Sub Committee	6 July 2016
Subject: Energy Targets Update – Annual Review 2015/16	**Public**
Report of: City Surveyor	**For Information**
Report author: Mansi Sehgal, Corporate Energy Manager	

Summary

This report provides an annual performance update on energy reduction targets set out in the Carbon Descent Plan 2015 (CDP-15) and energy spend. The performance update covers the 12-month period from April 2015 to March 2016 and includes changes in the reporting methodology (weather correction) and introduction to performance benchmarking.

The current analysis shows an overall energy consumption reduction of 1.2% for the 12-month period April 2015 to March 2016 compared to the same 12-month period in 2014/2015. The achieved reduction falls short of the target of 2.25% reduction for this period. The overall performance, based on the existing target trajectory from the baseline year 2008/09, shows a reduction of 15% in absolute terms and 13% weather corrected to date.

At present the City of London Corporation (CoLC) is following the trajectory set out in the London Plan[1] of reducing energy consumption. Having to meet these aspirational targets (of 40% reduction by 2025) is quite a challenging task especially when the CoLC is already under pressure to perform on other competing priorities such as using its assets more efficiently and increasing revenues by organising more events in Guildhall.

The gross annual energy cost (excluding vehicle fuel and water) for 2015/16 was £15.78m, 1.3% lower than for the previous year. That represents 15.6% of the total premises costs.

This report also provides an overview of the future direction of Energy Management in the City Corporation. For example, at present the energy targets are measuring absolute reductions in kWh. Going forward the Energy Management Team would like to introduce targets which will be measuring operational efficiencies and cost savings/avoidance. As a result we are proposing to develop an overarching 'Energy Strategy' that will look to review our current state and propose various strands of work to improve upon both costs and efficiencies.

By developing an Energy Strategy and interlinking it with other initiatives currently progressing, most notably the Strategic Asset Management (SAM) review and the AECOM recommendations[2] we can look to tackle the energy efficiency agenda centrally and cohesively rather than via the current piecemeal departmental approach.

[1] https://www.london.gov.uk/what-we-do/planning/london-plan/current-london-plan
The London Plan http://www.london.gov.uk/sites/default/files/London%20Plan%20March%202015%20%28FALP%29.pdf

[2] AECOM carried out a study in 2013 to advise the CoL in achieving 40% energy reductions. A set of 14 recommendations were put forward as part of this project which are currently being progressed.

Recommendation

It is recommended that Members:

- Note the contents of this report.
- Support various departments in taking positive actions related to energy reductions.
- Support the progress towards an Energy Strategy and a more cohesive approach to its implementation.

Main Report

Performance Monitoring

Revised Methodology

1. The Energy Team has revised the methodology to assess the energy performance. This change was also recommended in the AECOM study carried out in 2013 and more recently has also been requested by Members.

2. The annual energy consumption figures reported below have been corrected for the variations of the weather. This method allows a more accurate assessment of the performance trend. The weather corrected trend seeks to remove the weather influence and produce a truer estimation of performance change.

3. In addition, the performance of most departments has been benchmarked against standards informed by CIBSE guidance[3]. This allows the overall energy intensity of the departments, as measured by kWh/m^2 (gross internal floor area) for electricity and heating, to be compared to typical building standards.

Current Performance

4. The table below indicates the weather corrected energy consumption for 2015/16 is 1.2% lower than the same period in 2014/15. However this reduction has not met the current annual target of 2.25% reduction as set out in the Carbon Descent Plan. Please see Appendix 1 for information on targets.

Table 1: Yearly performance comparison based on weather corrected data

Department	2014/15 (kWh)	2015/16 (kWh)	% Change
Guildhall	22,017,115	22,231,465	1%
Barbican Centre	16,749,146	16,245,679	-3%
Walbrook Wharf	1,978,875	1,817,580	-8%
Built Environment	7,617,451	7,431,443	-2%
Mansion House	2,080,991	1,984,702	-5%
GSMD	6,354,981	7,240,495	14%
CoL Boys	2,895,284	2,751,121	-5%
CoL Girls	2,145,475	2,283,059	6%
CoL Freemen's	3,894,732	3,904,141	0%
Central Criminal Court and Mayor's Court	8,033,499	7,892,490	-2%
Markets	30,545,891	30,739,304	1%
Culture, Heritage & Libraries	5,108,890	4,883,135	-4%
Open Spaces	5,624,932	5,815,558	3%
Police	7,438,815	5,829,798	-22%
Total	**122,486,077**	**121,049,969**	**-1.2%**

[3] Chartered Institute of Building Service Engineers, as set out in Guide F, TM46 and the most recent Display Energy Certificates

Commentary

5. At present there are no specific energy related targets set out in the Corporate Plan. This will be reviewed as part of the work on the 2017 Plan. In the meantime we are providing a summary of the targets listed in City Surveyor's Business Plan (2015-19). Please refer to Appendix 2 for individual Departmental commentary.

KPI 6 (a) – To pursue corporate wide energy reduction

6. As shown in table 1, the overall energy consumption has reduced by 1.2% from 2014/15. This reduction is the result of project works undertaken at various sites and closure of assets like Bernard Morgan House. Nevertheless it is still short of the overall annual reduction target of 2.25%.

KPI 6 (b) – To pursue energy reduction in Guildhall and Wallbrook Wharf

7. The consumption at Guildhall has slightly increased by 1%. This increase is the result of plant room issues that are currently being investigated. In addition the increase might not be presenting a true picture as the consumption reported in 2014/15 was lower mainly because the Art Gallery was closed for approximately 3 months (between Sep'14- Jan'15). In Wallbrook Wharf**,** a reduction of 8.2% has been observed compared to 2014/15 levels. This is the result of the installation of energy efficient LED lights with occupancy controls, installation of a new efficient boiler and on-going monitoring of the BEMS and making seasonal adjustments as required.

8. Both sites were also compared against building benchmarks:

Table 2: Benchmark comparison[4]**,**

	Electricity kWh/m2					Heating kWh/m2				
	Actual 2014/15	Actual 2015/16	% change	Benchmark	Score	Actual 2014/15	Actual 2015/16	% change	Benchmark	Score
Guildhall	186	188	0.8%	92	POOR	188	190	0.9%	144	POOR
Walbrook Wharf	61	60	-1.7%	103	GOOD	50	42	-15.8%	114	GOOD

9. The Guildhall's electricity consumption is 188 kWh/m^2 compared to typical benchmark of 92 kWh/m2, which indicates a poor performance. However this is partly due to the inclusion of consumption for computer servers hence it does not reflect a true picture. We will look to improve this in next few months and introduce another performance metric to provide a better overview.

10. For Walbrook Wharf the electricity consumption is 60 kWh/m^2 compared to typical benchmark of 103 kWh/m^2, which indicates a good performance. The heating consumption is 42 kWh/m^2 compared to typical benchmark of 114 kWh/m^2 which also indicates good performance.

11. For other departments' benchmarked performances please refer to Appendix 3.

12. We further compared the performance against the baseline year 2008/09. These results are presented in figure 1 below as a cumulative change against targets. It can be seen that there is a gap between the existing performance and the target that was set in the CDP 2015. It also represents a constant consumption pattern from 2012/13 onwards.

[4]Chartered Institute of Building Service Engineers, as set out in Guide F, TM46 and the most recent Display Energy Certificates

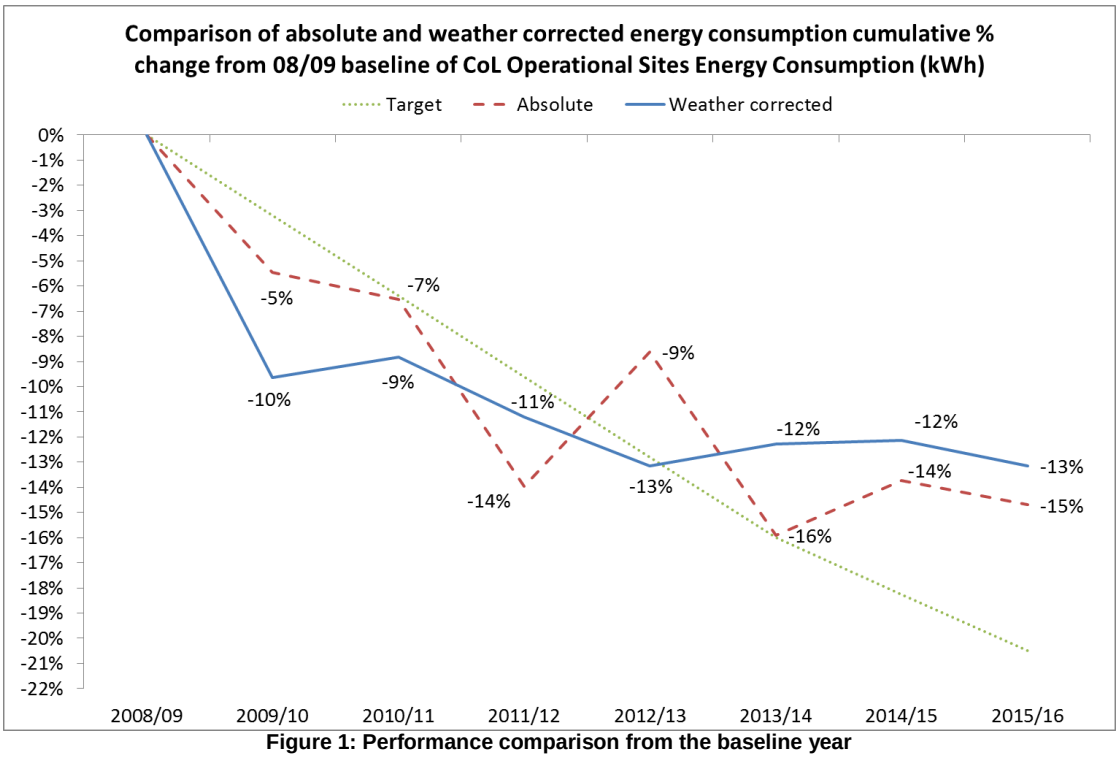


Figure 1: Performance comparison from the baseline year

Energy spend

13. The total gross annual energy cost (excluding vehicle fuel and water) for CoLC was £15.78m in 2015/16, 1.3% lower than the 2014/15 spend of £16m. Please note these costs also include the utility spend on the Investment Portfolio and Housing that do not fall part of CoLC's energy targets set out in the CDP-15. They currently make up approximately 35% of the overall spend. The current energy spend represents 15.6% of the total premises costs (which was £90 m in 2015/16). In the next report, we will aim to provide a benchmark of CoLC's performance against its peers.

14. It should be noted that the energy spend that the end user pays is not directly related to the market commodity price. This is because the energy spend is composed of two components: commodity consumption costs, and non-commodity fixed costs which mainly include charges related to transmission and distribution, etc. Over recent years the non-commodity components of the energy spend has risen significantly, and at present it represents approximately 44% of the overall spend.

15. The Energy Team will be looking at various schemes for managing electricity demand and generation such as available capacity, peak demand management, and demand-side response to reduce the non-commodity part of the energy spend.

Strategic Planning for Future Energy Reductions

Energy Strategy

16. In the short term the Energy Team proposes to develop an 'Energy Strategy' for the CoLC's premises included within this report, which will focus on the following (please note the list below is only indicative):

- CoLC's position in leading the energy agenda within the Square Mile.
- Comparison of CoLC's progress within a national and regional context.
- Review of targets, baseline and ensuring we are capturing the efficiencies.
- Steps to reduce costs, consumption, and environmental impacts in the longer run through:
    i. proactive monitoring and targeting of energy consumption and control systems to identify and resolve issues of waste and inefficiency early;
    ii. implementing energy saving projects through the EEF (Energy Efficiency Fund);
    iii. exploring a whole-life-cost procurement approach to ensure long-term investments deliver best-value through energy efficient buildings and services;
    iv. exploring strategic options for district energy networks, decentralised energy, and renewables; and
    v. exploring energy management and energy efficient building standards.
- Preparing CoLC for legislative changes.
- Identifying sources for income generation.

17. Please refer to Appendix 4 for further information.

Energy Procurement

18. Following approval from the Court of Common Council in March, the Energy Team has progressed on signing a two year contract for buying utilities through LASER (energy brokers). In the near future the team, in collaboration with City Procurement, will be testing the market for alternative providers. The present utility contract with LASER is worth approx. £12.5 m hence it is imperative for us to ensure that we get the best value deal going forward.

19. Buying electricity and gas in the whole sale market is a very specialist function (as it involves a range of activities built around economies of scale, bargaining power and commodities and market intelligence etc.) and therefore it is best to outsource such type of functions to specialists in the industry who are able to negotiate best deals for their customers based on their position in the market. LASER currently buys energy on behalf of 180 public bodies with an estimated annual value in excess of £450M. It also currently purchases around 5 Terra Watts (TW) of gas and 3 TW of electricity across its customers representing around 2% of the non-domestic UK market.

20. The majority of the Corporation's purchasing through the LASER energy buying group is on a flexible procurement basis. In a flexible purchasing arrangement all fixed charges for energy supply, such as transmission, distribution, and metering and data collection are pre-settled. LASER carries this out by aggregating the volumes of all the local authorities and public bodies with which it is contracted into one single portfolio to achieve the best prices. This provides a layered risk approach that can help to minimise the volatility of energy prices

AECOM (Strategic Energy Review)

21. A Programme Board, chaired by the Deputy Town Clerk, was established in 2015 to co-ordinate the implementation of the AECOM recommendations set out in 2013 study, and agreed by the Summit Group in 2014 (the recommendations are listed in Appendix 5). The Board meets to:

- review progress on the individual projects and on the overall programme
- help overcome any obstacles that might get in the way of full implementation according to the timescales that we will be agreeing with you, and
- ensure that the correct links are made with other reviews that are already in progress or planned in the future – that would include Operational Property; Accommodation and ways of working; Facilities Management, and Contract Management

22. With the help of the Board we aim to implement all the AECOM recommendations which we believe will ultimately help in fill the gap shown in figure 1. Appendix 6 illustrates how implementing the AECOM recommendations is predicted to impact on reducing energy consumption by 2025/26.

23. Following Members' agreement to the establishment of an Energy Efficiency Fund, the Board has agreed the terms and conditions and the format of the business case template. This was launched in June 2016. The Fund will allow for easy access to finance, enabling the City Corporation to make strategic investments in its operational properties in order to reduce energy consumption and counter the impact of rising energy prices. The Programme Board will act as the decision making body in respect of applications to use the Fund.

24. The next steps for the Board are to:
    - Work with the lead officers to establish the continued relevance of the recommendations (as they are now nearly three years old), quantify the potential savings, and assign a priority rating to those recommendations that are still worth pursuing
    - Develop a Roadmap, summarising progress on the individual recommendations, for reporting to the Strategic Resources Group and Summit Group.
    - Develop a clear communications plan, to inform staff across the City Corporation about the programme and the outcomes.

<u>Energy Team</u>

25. The past year was mainly focussed on implementing the new team structure and recruiting for the new posts. The new team is now in place can progress the above tasks. Further detail for some of the above-mentioned projects is provided in Appendix 4.

Conclusion

26. Even though CoLC has reduced its overall energy consumption from last year, it is apparent that a further effort is required to achieve the reductions that were set in the CDP plan 2015. Therefore it is recommended that CoLC takes a more pro-active approach from 2016/17 onwards to be able to meet its targets.

27. We believe by developing an Energy Strategy and interlinking it with other areas of works such as the Strategic Asset Management (SAM) review and the AECOM recommendations the CoLC can look to tackle the energy efficiency agenda cohesively rather than via the current piecemeal departmental approach.

Appendices

- Appendix 1 – Energy Targets
- Appendix 2 – Departmental performance commentary
- Appendix 3 - Performance against Benchmarks
- Appendix 4 – Future projects for the Energy Team
- Appendix 5 – AECOM Recommendations
- Appendix 6 - AECOM Recommendations impact on energy targets

Mansi Sehgal
Corporate Energy Manager
City Surveyor's Department

T: 020 7332 1130
E: mansi.sehgal@cityoflondon.gov.uk

Appendix 1: Energy Targets

Energy Targets

a. In June 2014 Chief Officers agreed to adopt further energy reduction targets as part of the City's overall strategy to reduce the energy usage by 40% by 2025. Further reductions of 9% have been targeted above the 16% already achieved in 2013/14 below the baseline year of 2008/09.
b. Below is a representation of the targets adopted by the City of London to date. These targets do not monitor the consumption related to the Investment property and Housing portfolio.

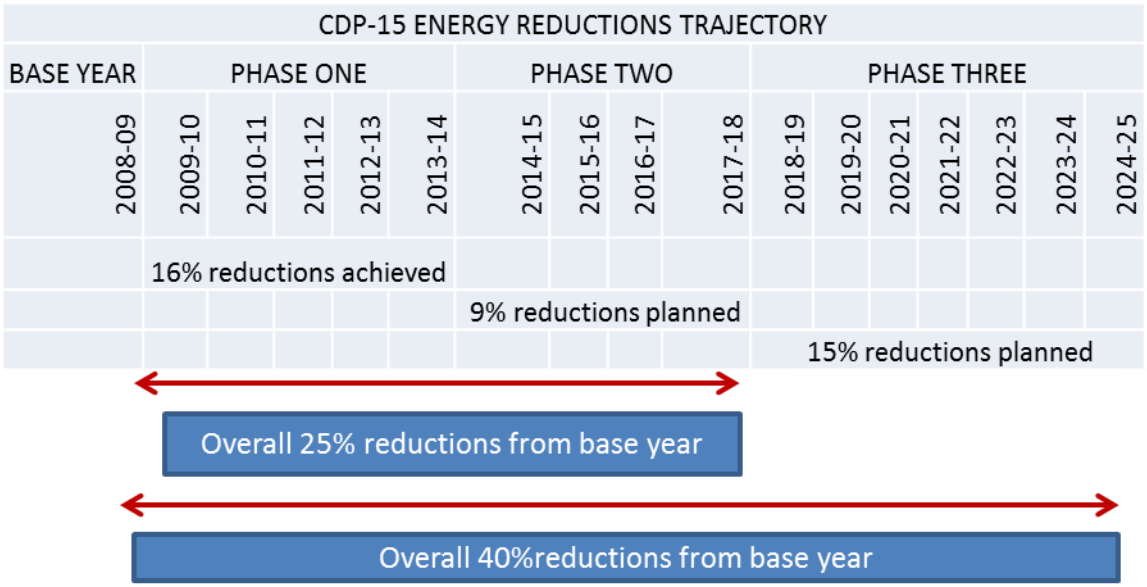


Fig 2: City of London's Energy Reduction Trajectory

Appendix 2: Departmental commentary based on weather corrected data

At present no energy reduction targets have been set or allocated for each department. As a result, the commentary below is based on the assumption of applying the wider target of achieving annual reduction of 2.25% each year. In the near future, we shall be discussing and agreeing on individual departmental targets which will be in line with the corporate direction that we will set out in the Energy Strategy work.

1. **Guildhall**: 1% increase
   This increase is partially due to the heating and cooling issues reported at GYE that are currently being investigated. In addition the consumption reported in 2014/15 was also lower mainly because the Art Gallery was closed for approximately three months (between Sep-14 to Jan-15). In addition other refurbishment projects including the alterations to the 2nd floor North Wing, refurbishment of the Members Boardroom, the Heritage Gallery projects and Gallery ductwork cleaning & North Wing Restaurant ventilation works contributed towards the recorded low consumption in 2014/15.

2. **Barbican Centre**: 3.0% decrease
   Electricity and gas consumption increased marginally by 1% and 2% respectively. However the chilled water supply from Citigen decreased by 12% and Citigen heat supply decreased by 6% which resulted in the overall decrease in the Barbican's energy consumption of 3%. The reason for the chilled water reduction may be related to a milder summer in 2015 and therefore less demand for space cooling. The figures are not current weather corrected for cooling demand and hence this influence is reflected in the results. The reduction in Citigen heat supply is mainly a meter reading issue as in 2014/15 estimated readings were used due to a faulty meter and may have resulted in a lower reported consumption in that year than actually occurred.

3. **Walbrook Wharf**: 8.2% decrease
   The 2% reduction in electricity could be related to the installation of energy efficient LED lights with occupancy control. The 16% reduction in gas is likely due to a new boiler being installed and ongoing monitoring the BEMS and making seasonal adjustments as required.

4. **Built Environment**: 2.4% decrease
   There were notable reductions at Millennium Bridge Lift (66% lower), which is likely related to the installation of LED lighting. There were also significant reductions at Upper Thames Street Tunnel Lighting (18% lower), and Manual Public Toilets Tower Hill (86% lower).

5. **Mansion House**: 4.6% decrease
   There was a 2% reduction in electricity, and overall 7% reduction in gas. This is the result of their initiatives of switching the plant off when not needed. During August it was switched off for most of the month as there were no events and the kitchens were not operational. Traditional lights have been switched to LED – the project that was in part carried out last year and part of it was completed this year.

6. **GSMD** (incl. Milton and Sundial Court): 13.9% increase
   Electricity consumption has remained fairly similar with only a 2% increase. The reason for the overall increase in energy consumption is mainly due to a 41% increase in the Citigen heat supply. The reason for this increase is likely a combination of lower Citigen heat supply in 2014/15 (due to heat network issues) and an increase in demand for heat

from GSMD due to greater operating hours for events (concert halls and theatres). The Citigen issues have been resolved and GSMD have recently improved the heat transfer connection efficiency.

7. **City of London's Boys School**: 5.0% decrease
   There was a 3% reduction in electricity and 7% reduction in gas consumption use for heating and hot water due to rectification of fault with controls.

8. **City of London's Girls School**: 6.4% increase
   There was a 12% increase in electricity and a 20% reduction in gas (incl. 40% reduction in use at Marvels Lane Sportsground). The school's swimming pool (which represents approx. a quarter of their electricity consumption) was out of action between May 2014 and January 2015. As a result it impacted the performance numbers reported in 2014-15. At present the pool is currently in use for 7 days a week resulting in higher consumption overall. Furthermore as a result of the two recent extensions (of approx. 200 sqm) in the school the overall consumption has been increased. The school's private hire has also been recently increased which usually requires heating and ventilation systems to remain switched on for longer time periods.

9. **City of London Freemen's School**: 0.2% increase
   A 10% reduction in electricity. The 7% increase in gas, mostly due to new boarding school building. In addition the 2014-15 the consumption was low partially due to some faulty boilers having an impact on the overall consumption.

10. **Courts**: 1.8% decrease
    5% increase in electricity, related to the Central Criminal Court, mainly occurred over Jan-Mar 2016 and potentially related to extended opening hours for refurbishment works. 15% reduction in gas and 8% reduction in oil for CCC is related to a new gas boiler. There has been a change in catering requirements and reduction in the number of court sessions this year compared to last year.

11. **Markets**: 0.7% increase
    Overall 1% increase in electricity with some sites contributing to higher consumption (Spitalfields and Billingsgate) and others to lower consumption (London Central Markets). A 3% reduction in gas, but this is overall a lower proportion of the total energy use. A 6% increase in Citigen heat and 2% decrease in Citigen chilled water to London Central Markets.

12. **Culture, Heritage & Libraries**: 4.4% decrease
    Tower bridge gas consumption reduced by 15% and electricity by 3%, possibly due to site occupancy variations. London Metropolitan Archives gas consumption reduced by 10% but electricity increased by 22% which is due to a maintenance issue related to chillers which Mitie is currently investigating.

13. **Open Spaces**: 3.4% increase
    Overall increase mainly due to increase gas consumption at the Crematorium. In 2014-15 the consumption was particularly low partly due to the office building (Office Garden) being without heating for six months due to an issue with central heating boilers.

14. **The City of London Police Estate**: 21.7% decrease

    Overall the Police Estate energy consumption reduced by 1,891,017 kWh of which 34% was due to the vacation of Bernard Morgan House, 38% due to reductions at Bishopsgate Police Station, and 10% due to reductions at Wood Street Police Station.

Appendix 3: Performance against Benchmarks

The performance of most departments has been benchmarked against standards informed by CIBSE guidance[5]. This allows the overall energy intensity of the departments, as measured by kWh/m^2 (gross internal floor area) for electricity and heating, to be compared to typical building standards, see table 3. This provides another indication of performance, and the table indicates where performance is better or worse than typical. Where there no direct comparisons available we have marked them blank (TBCs) as these consist of many different types of buildings and a composite benchmark will need to be developed in due course to compare their performance.

The Energy Team will be looking to expand on this in the 2016/17 reporting period with further intensity usage indications, such as “workplace density” which is calculated as the NIA divided by the number of workstations in an office building.

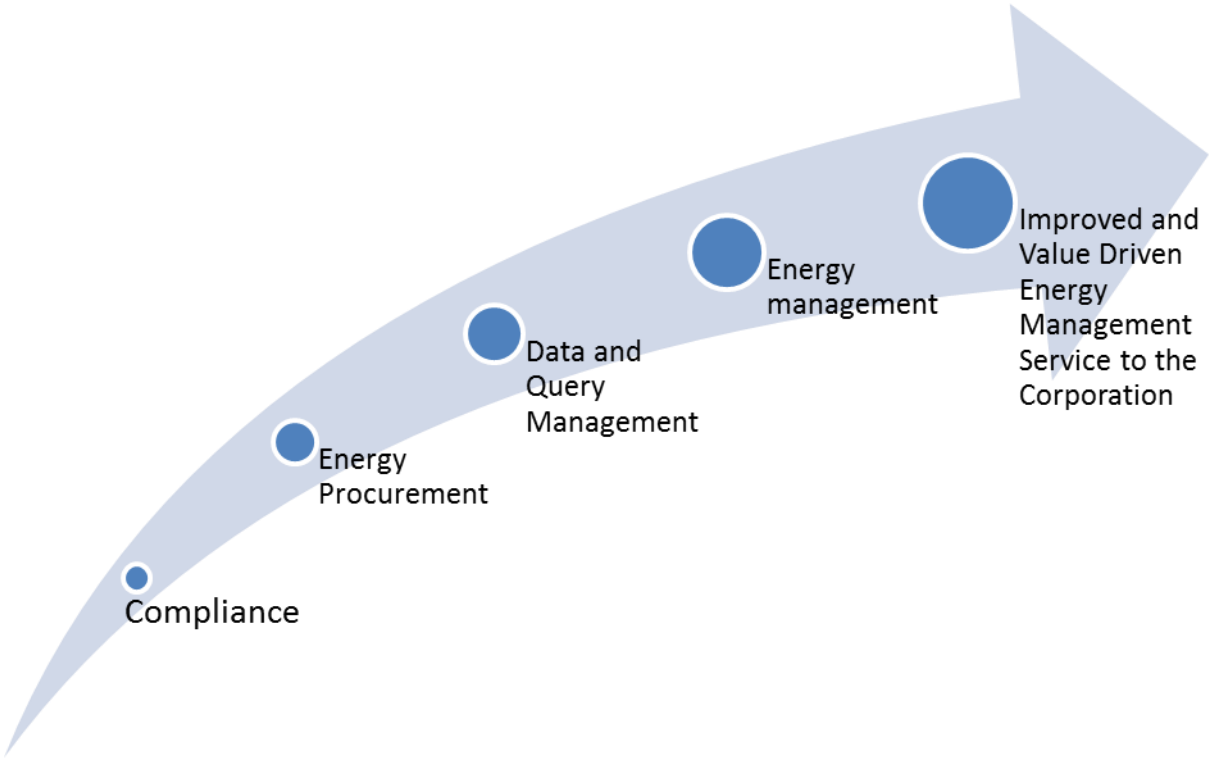
	Electricity kWh/m2					Heating kWh/m2				
	Actual 2014/15	Actual 2015/16	% change	Benchmark	Score	Actual 2014/15	Actual 2015/16	% change	Benchmark	Score
Guildhall	186	188	0.8%	92	POOR	188	190	0.9%	144	POOR
Walbrook Wharf	61	60	-1.7%	103	GOOD	50	42	-15.8%	114	GOOD
Barbican Centre	109	109	0.7%	70	POOR	96	89	-7.6%	175	GOOD
Built Environment	125	122	-2.3%	TBC	TBC	NA	NA	NA	NA	NA
Mansion House	104	102	-1.7%	73	POOR	155	145	-6.5%	303	GOOD
GSMD	96	102	7.0%	54	POOR	72	98	35.8%	166	GOOD
CoL Boys	64	62	-2.9%	32	POOR	87	81	-6.4%	164	GOOD
CoL Girls	169	189	11.8%	115	POOR	38	31	-19.8%	132	GOOD
CoL Freemen's	77	69	-10.5%	33	POOR	124	132	6.6%	144	OK
Courts	81	85	4.9%	74	OK	132	123	-6.7%	182	GOOD
Markets	242	243	0.5%	123	POOR	79	80	0.8%	8	POOR
Culture, Heritage & Libraries	139	139	0.6%	TBC	TBC	98	87	-11.9%	TBC	TBC
Open Spaces	38	39	4.8%	TBC	TBC	84	86	2.6%	TBC	TBC
Police	111	109	-2.3%	67	POOR	114	85	-25.7%	456	GOOD

Table 3: Normalised and benchmark performance comparison

[5] Chartered Institute of Building Service Engineers, as set out in Guide F, TM46 and the most recent Display Energy Certificates

Appendix 4: Future projects for the Energy Team

The Energy Team have the following key deliverables and looking to provide an improved value driven service to the Corporation.



Even though the team is currently covering all of the above, there is a scope for improvement in each area. The team is looking to work on the following strategic strands in next few months to improve upon from the current state:

a) Develop an overarching 'ENERGY STRATEGY' for the Corporation which will focus on (please note the list below is only indicative):

- CoLC's position in leading the energy agenda within Square Mile.
- Comparison of CoLC's progress within a national and regional context.
- Review of targets, baseline and ensuring we are capturing the efficiencies.
- Steps to reduce costs, consumption, and environmental impacts in the longer run through:
    i. proactive monitoring and targeting of energy consumption and control systems to identify and resolve issues of waste and inefficiency early;
    ii. implementing energy saving projects through the EEF (Energy Efficiency Fund);
    iii. exploring a whole-life-cost procurement approach to ensure long-term investments deliver best-value through energy efficient buildings and services; exploring strategic options for district energy networks, decentralised energy, and renewables; and
    iv. exploring energy management and energy efficient building standards.
- Preparing CoLC for legislative changes.
- Identifying sources for income generation.

Timeline: Hoping to have the first draft ready for circulation in October 2016.

b) Utilities Procurement

- The CoLC have been using LASER as its energy broker since 2009. Recently a new contract was signed with LASER covering a two year period (Oct'16-Sep'18).
- The utilities market has changed a lot in recent years. Many new players have come on board offering innovative products and embedding sustainability / green principles within energy procurement. As a result the energy team is looking to carry out a market research and ascertain the best suitable option available for the next generation contract starting from Oct'18.
- The current utilities spend in the Corporation is approximately £16 m and therefore worth investigating further given that energy costs are moving in general on an upward trajectory.

Timeline: to be discussed and agreed with City Procurement

c) Streamlining Compliance offerings for the Corporation:

- The CoL qualifies to participate in various carbon and energy compliance schemes including the Carbon Reduction Commitment Energy Efficiency Scheme (CRC EES), the Energy Savings Opportunity Scheme (ESOS), Display Energy Certificates (DECs), Energy Performance Certificates (EPCs), Heat Network Metering Regulations (HNMR) etc.

- At present the Energy team manages the delivery of most of the compliance schemes nevertheless there is a scope of improvement to align / streamline the service for the Corporation.

- For example it is not very clear at present if the Energy Team should be leading in delivering the DECs services for the Corporation. At present the team is project managing the delivery however there are a few sites/ departments who are carrying out their own DECs. Obviously it will be more cost effective if there is one central delivering point of such services within the Corporation.

Timeline: Dec'16- Mar'17

d) Exploring market opportunities to generate revenue and avoiding penalties.

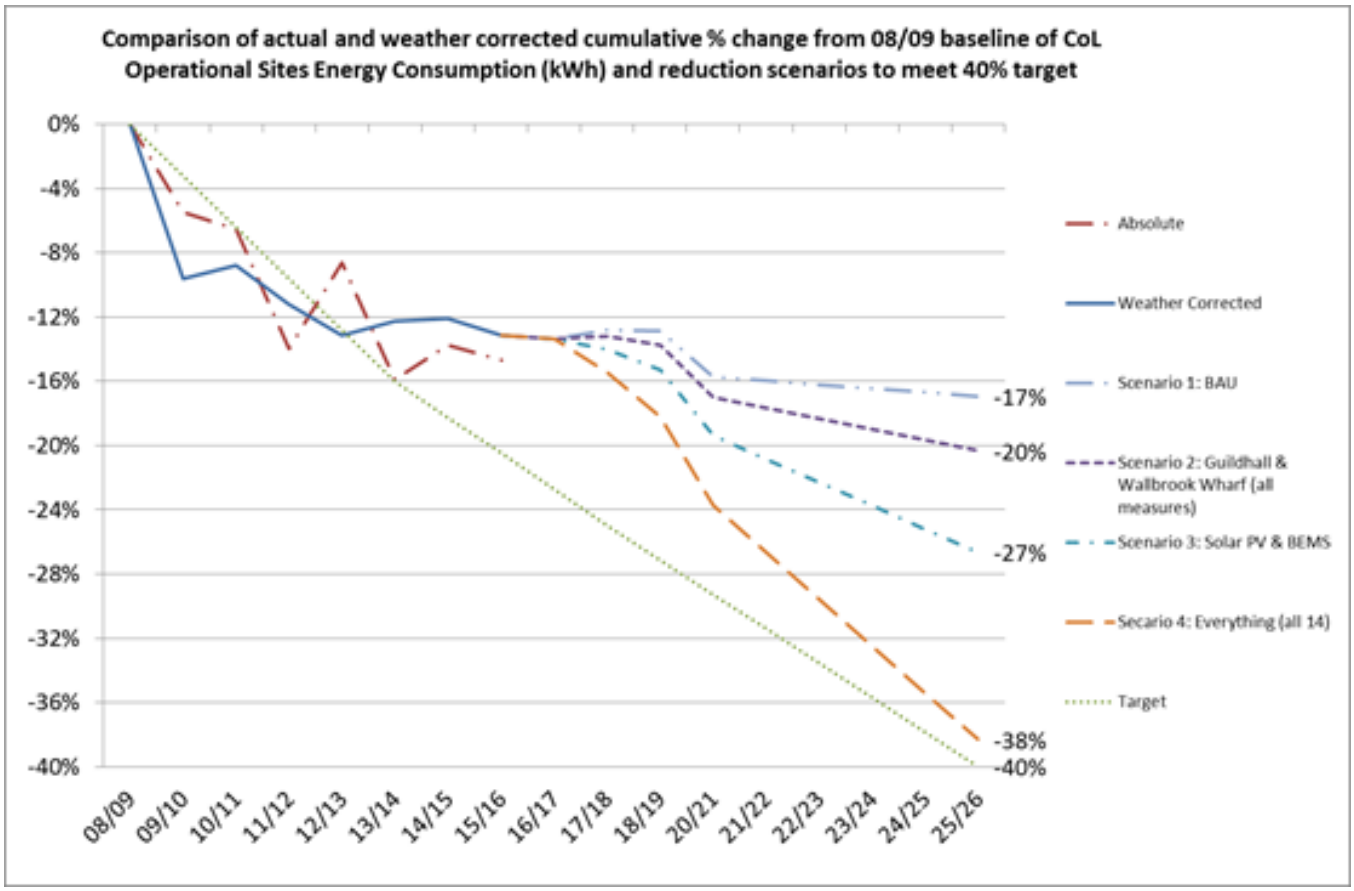
- As said above the energy industry is constantly changing and it is imperative for the team to ensure they are up-to-date with the changes taking place in the industry and delivering any benefits to the Corporation as a result.
- To illustrate the above the National Grid has recently launched an initiative called Demand Side Response (DSR) which allows customers to manage its consumption patterns i.e. by moving consumption away from high priced times of 4-7pm for example.
- The Energy Team is keen to explore such opportunities in the near future to bring in additional savings from such initiatives.

Timeline: Hoping to identify one or two projects as a result by March 2017.

Appendix 5: AECOM Recommendations

- Building Prioritisation - The main focus of investment should be on Guildhall and Barbican Centre followed by buildings that attribute maximum direct savings direct to the City Corporation.
- Technology Prioritisation - Priority Energy reduction technologies are BEMS, Insulation, Lighting, Savacontrols, LED Lighting and Street Lighting.
- Public and Street Lighting - upgrade standard lamps to LED lanterns, greater control and dimming.
- Space rationalisation - to maximise accommodation utilisation in particular at Guildhall and Walbrook Wharf adopting a sharing ratio of 80%.
- Citigen private wire – explore the potential to take electricity direct from Citigen's CHP generation.
- Changes to Building Repairs and Maintenance Contract – how to incentivise [the contractor] to bring forward proposals for energy.
- In-house BEMS manager – prepare person spec and recruit dedicated in-house BEMS engineer.(Implemented)
- Metering Strategy – to develop high level energy metering strategy.
- IT server – move City Corporation main IT servers offsite. Consider relocation / consolidation of Police and Barbican/GSMD servers.
- Soft Landings – adopt Government Soft Landings (GSL) approach to projects along with the use of Building Information Modelling.
- Energy Efficiency Fund – establish an internal energy efficiency fund and bidding mechanism. (Implemented)
- Sources of funding – to identify funding sources linked to recommendation 10 above.(deleted following the AECOM board review in 2015)
- Additional Works Programme (AWP) and Cyclical Replacement – to review AWP process to facilitate enhanced saving potential.
- Weather correction – should be incorporated in review of energy reporting and targets. (Implemented)
- PVs – City Corporation should consider potential for installing large PV arrays on those buildings with suitable large roof areas and significant daytime on-site electricity demand. Commission high level feasibility study to consider this potential further.

Appendix 6: AECOM recommendations and CDP Energy Targets



Notes:

- Absolute: presents the change in the actual energy consumption from 2008/09 to 2015/16
- Weather Corrected: presents the weather correction of the historical consumption to 2015/16
- Scenario 1: Business As Usual, this includes estimated savings from continued energy efficiency measures and changes to the estate assets
- Scenario 2: Implementation of all measures identified for Guildhall and Walbrook Wharf
- Scenario 3: Install PV arrays (1MW of panels) and Building Energy Management System and control improvements across all sites
- Scenario 4: Implement all the AECOM recommendations and identified energy saving opportunities
- AECOM originally proposed measures to meet the 40% target. This included assumptions about changes to CoL assets, such as building closures. Current analysis indicates that the savings from these changes are less than originally anticipated and therefore there is a 2% gap from target remaining.