Committee:	Dated:
Corporate Asset Sub-Committee (CASC)	September 15th 2020
Subject: 2019/20 Annual Energy Performance Report & 2020/21 Quarter 1 Update	**Public**
Report of: The City Surveyor	**For Information**
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SUMMARY

This report presents the 2019/20 annual energy performance for CoL operational sites (part A), and an update on 2020/21 quarter 1 (part B).

The annual result for 2019/20 was a **4.1%** reduction in energy consumption from 2018/19 when corrected for the impact of weather, exceeding the 3.1% annual target. Compared to the 2008/09 baseline the energy consumption reduced by 20.3% in absolute terms, and **17.7%** when corrected for the weather.

The quarterly result for Q1 2020/21 was a **36%** reduction in energy consumption compared to Q1 2019/20. This unprecedented reduction was mostly due to the reduction in building activities and operations as a result of the coronavirus lockdown.

Recommendations

- Members are asked to note the contents of this report.
- Energy Team to present a report at the next CASC meeting on the energy implications of covid-19.
- Energy Team to produce a formal report covering CO_2 emissions, energy consumption and cost to CASC on an annual basis with a management and resource plan.
- Members are asked to acknowledge the need to replace the current Energy Management software at a cost of £50k., noting that the cost will be met from the City Surveyor's local risk budget.

MAIN REPORT

Performance update

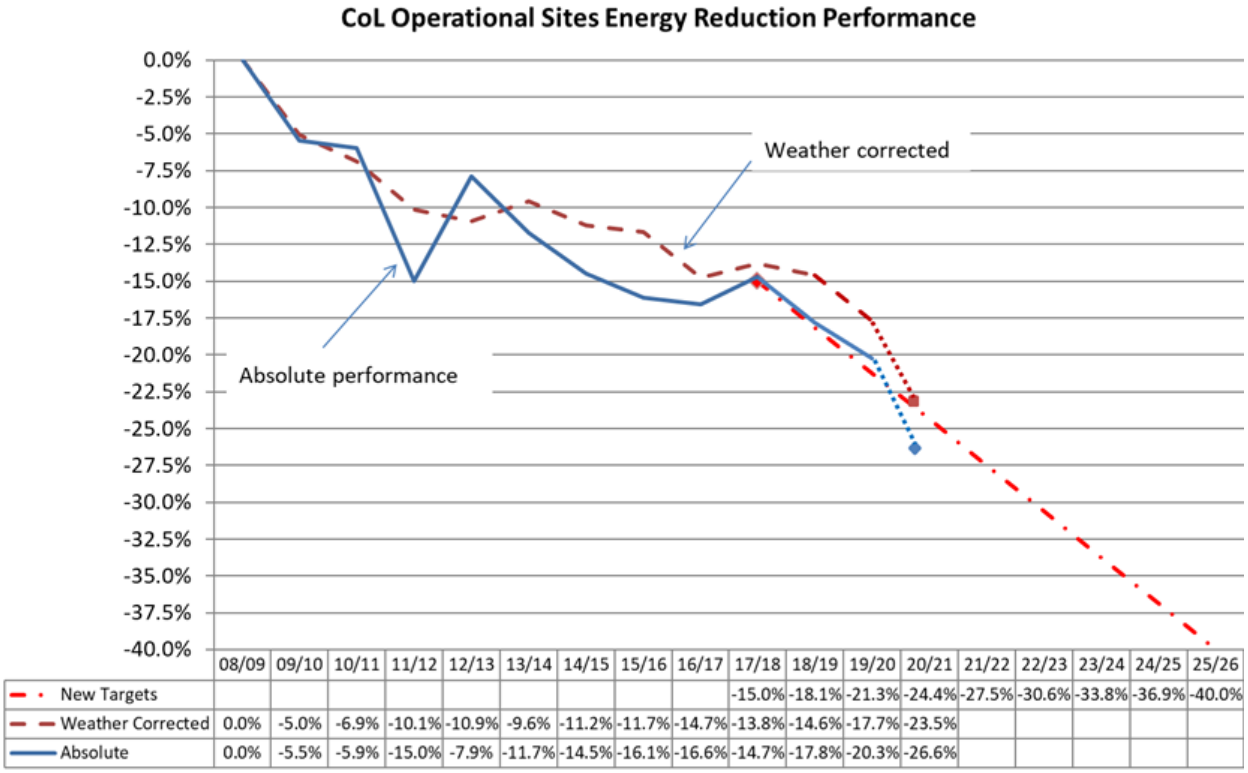
PART A: 2019/20 Annual Energy Performance

1.1 Long-term: chart 1 below, presents an update on the long-term performance against target, and the interim performance up to Q1 20/21 (dotted lines). The annual result for 2019/20 was a **4.1%** reduction in weather corrected energy consumption from 2018/19, exceeding the 3.1% annual target.

Compared to the 2008/09 baseline, the energy consumption reduced by **20.3%** in absolute terms, and 17.7% when corrected for the weather.

Table 1 presents the performance of the top 5 and bottom 5 performing sites in terms of energy consumption. Appendix 1 provides a further comparison of the top 30 consuming sites and the slides to accompany the report.

Chart 1. Overall performance change from the 2008/09 base year



	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26
New Targets										-15.0%	-18.1%	-21.3%	-24.4%	-27.5%	-30.6%	-33.8%	-36.9%	-40.0%
Weather Corrected	0.0%	-5.0%	-6.9%	-10.1%	-10.9%	-9.6%	-11.2%	-11.7%	-14.7%	-13.8%	-14.6%	-17.7%	-23.5%					
Absolute	0.0%	-5.5%	-5.9%	-15.0%	-7.9%	-11.7%	-14.5%	-16.1%	-16.6%	-14.7%	-17.8%	-20.3%	-26.6%					

Table 1. Energy comparison by top 5 and bottom 5 sites: 2019/20 with 2018/19

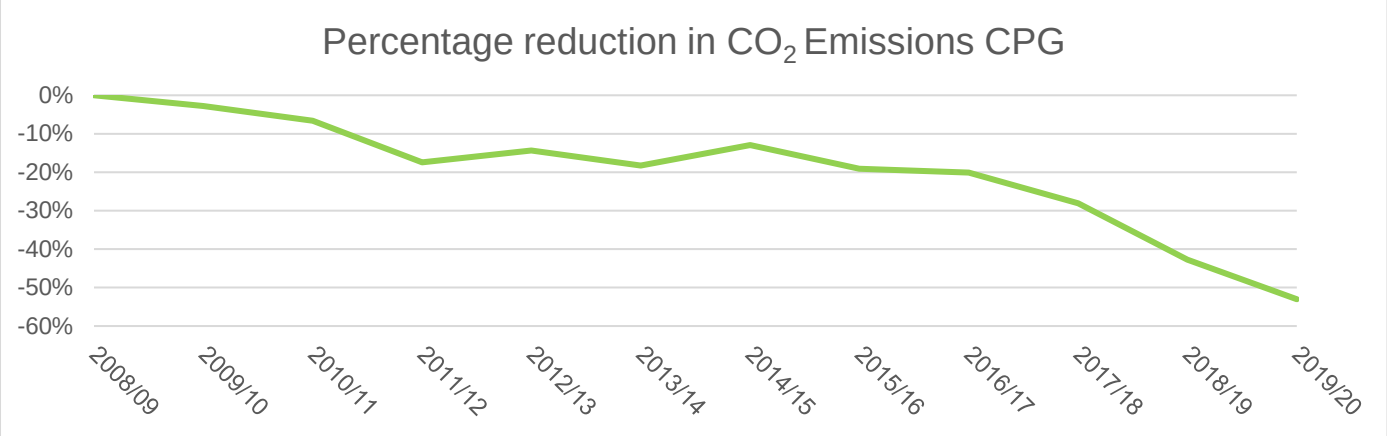
	Weather corrected rolling 12-month comparison: 12 months to Mar-20 (2019/20) compared to 12 months to Mar-19 (2018/19)			
Site Name	**2018/19**	**2019/20**	**kWh Diff.**	**Diff. %**
Top 5				
Smithfield Mkt	18,249,797	14,234,816	-4,014,981	-22.0%
Central Criminal Court	7,804,714	6,845,054	-959,660	-12.3%
GSMD - Milton Court	3,876,988	3,057,846	-819,142	-21.1%
Streetlighting	3,622,410	3,146,017	-476,393	-13.2%
Guildhall Complex	17,567,524	17,201,304	-366,219	-2.1%
Bottom 5				
Barbican Arts Centre	17,439,653	20,565,547	3,125,894	17.9%
Billingsgate Mkt	3,579,389	3,799,925	220,536	6.2%
Walbrook Wharf	1,726,608	1,902,766	176,158	10.2%
New Street (21)	1,807,820	1,902,878	95,058	5.3%
CoL School for Girls	2,250,299	2,340,477	90,178	4.0%

1.2 2019/20 summary: Smithfield Market was the main source of energy reduction, with contributions from the Central Criminal Court and Street Lighting and CoL Police accommodation changes. Barbican Art Centre was the main source of increased energy consumption.

1.3 CO_2 emissions: Since 2008/9 there has been a **53%** reduction in operational building related emissions. Whilst a significant proportion of this can be attributed to grid decarbonisation, the compounded savings in energy consumption have improved these further. The future potential for

decarbonising Citigen and decentralised heating will provide access to further CO_2 savings, complementing the downward trajectory of grid-based emissions. Additional investment in energy reduction and low/zero carbon technologies will be required to achieve the Carbon Descent Plan.

Chart 2: Percentage CO2 reduction from CoL operational sites.



1.4 Smithfield Market: An annual reduction of **22%** was mainly achieved through Energy Team led improvements in BEMS strategies and daily monitoring, providing comfort conditions as efficiently as possible. Total electricity reduced 11%, heating reduced 42% and cooling reduced 61% when corrected for the weather. Since the start of the new Energy Team initiatives in 2018, the cumulative avoided energy costs are ~**£425k** (up to Feb-20). The Energy Team, Skanska and FM are working closely together to ensure this is a sustained improvement. The Phase 1 programme includes upgrading the Car Park lighting to LED. The Energy Team will be seeking invest-to-save funding towards system improvements which would payback within 5-years.

1.5 Central Criminal Court (CCC): saw an annual reduction of **~12%** in energy usage. The Energy Team have worked with site FM to modify existing heating and implement new control system strategies. This contributed to a 25% reduction in oil and a 5% reduction in gas used for heating.

1.6 GSMD Milton Ct. energy decreased in 2019/20 by ~**21%.** Largely due to a 75% reduction in cooling supplied from Citigen. This is currently being investigated and is likely due to a network issue starving Milton Court of cooling.

1.7 Street Lighting. energy decreased ~**22%** in the last quarter of 19/20 contributing to an annual reduction of ~13%. This is a result of the LED rollout, which is almost complete.

1.8 Guildhall Complex (GHC): energy reduced in 19/20 by **~2%.** The main changes in energy were:

- 15% decrease in North Wing/Great Hall/Old Library electricity through Energy Team led BEMS control improvements to ventilation and cooling and the LED upgrade of the Great Hall lighting.

The Energy Team are delivering more BEMS control improvements, with focus on the East Wing ventilation systems and primary heating control.

1.9 Barbican Arts Centre (BAC): energy increased **~42%** in the last quarter of 19/20 contributing to an annual increase of ~18%. The main changes in energy were:

- 94% increase (+1187 MWh) in Exhibition Halls heating. Since Nov-18 up until the lock-down the heating consumption was far higher than historical norms. The main heating valve and control system appear responsible and require replacement.
- 67% increase (+1253 MWh) in Art Centre cooling due to a fault with the on-site electric chillers which supply the Art Gallery. Funding in principle has been agreed for the replacement of the chillers.

The Energy Team are working with FM to investigate the significant increases in energy consumption, including applying for invest-to-save funding towards site lighting upgrades which would payback within 5-years. BAC will revert to the Committee and provide an update for the next CASC.

1.10 Billingsgate Market: energy in 19/20 increased by **~6%**. Electricity increased by 5% following a new tenant equipment installation in Sep-18. Gas usage increased 8% over 19/20, likely due to heating control issues which the Energy Team are investigating.

1.11 Walbrook Wharf: energy increased annually by ~**10%**. Gas increased in the depot workshop following the reinstatement of heating. Increased occupancy from new tenants also led to increases in gas use for main office heating.

1.12 New Street (21): saw an annual increase of ~**5%** in energy use. This is likely related to the increased occupancy demands from accommodation consolidation. The Energy Team will work with FM to ensure heating systems are setup as efficiently as possible.

City of London School for Girls: annual energy increase of **~4%.** Electricity consumption for the swimming pool heating decreased ~20% due to a plant failure in Jan-20. This was countered by ~9% increase in electricity mostly related to space heating. The Energy Team have been working with the site to improve the control settings and will investigate further.

1.13 Reduction Programme:

Projects: The Energy Team led 'Phase 1' project, consisting of 8 invest-to-save projects, was given funding approval in principal and was approved at Gateway 2 in Apr-20. Phase 2 is under development and will be accelerated by additional resource joining in September 2020. The projected savings value is £260k/year

Procurement: The energy team are managing a revised procurement approach which will reduce cost exposure risk through forward buying. This will be closely integrated with the proposed Power Purchase Agreement which is expected to deliver a significant NPV saving.

Standards: Following the JLL report on sustainable buildings we propose the development of a suite of design and portfolio standards to "bake in" sustainability. This will be more fully detailed in the phase 2 action plan of this piece of work.

Management:

i) *Operational Improvement*: Operational improvements through management and control continue and have delivered £400k avoided costs in the last 12 months

ii) *software*: It is highlighted that investment is needed to upgrade the current Energy Management Software, to improve, communication, data analysis and identify critical energy saving opportunities through enhanced exception reporting and analytics. This will also provide more accessible reporting for broader carbon and resource management.

iii) Building Management Systems: The energy team are working on developing a proposal for an enhanced building management system across the portfolio which will deliver benefits across energy, working environment and maintenance as the platform for a smart buildings solution.

PART B: 2020/21 Quarter 1 Performance Update

2020/21 Q1 and coronavirus implications: when compared to Q1 2018/19, Q1 (Apr-Jun) 20/21 showed a reduction of **36%.** This unprecedented reduction was due to the reduction in building activities and operations as a result of the coronavirus lockdown.

The Energy Team have been working with Facilities Management and sites to remotely control the Building Management Systems, ensuring energy consumption is minimised while reducing the risks posed by covid-19 transmission. As buildings re-open and occupancy levels increase this will lead to higher energy consumption, and this could exceed normal levels due to the need for increased fresh air ventilation. The net energy balance for 2020/21 is uncertain under these unpredictable conditions, however the energy team are evolving a model and management plan for this.

Conclusion

The 4.1% reduction in 2019/20 exceeded the annual target. Significant savings were led by the Energy Team, in particular at Smithfield. However, the increasing consumption at Barbican Arts Centre is a challenge. The first quarter of 2020/21 saw an unprecedented 36% reduction on the same period the previous year. This was due to the lockdown, and the Energy Team have been assisting sites with minimising consumption whilst meeting the new covid-19 guidance. It is difficult to predict further pandemic impacts on energy consumption during the rest of 2020/21. The Energy Team are reviewing this and will communicate to key stakeholders in due course.

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