



City of London Corporation

# Climate Action Strategy

## NZ1 Corporate Property and Housing Landlord Areas

### Project Plan

Version 1.1

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## Project Introduction

### Project Aims

In support of the Climate Action Strategy (CAS), commencing implementation from April 2021, this Project Plan details how action will be accelerated to deliver carbon reductions and energy efficiency improvements for the owned and operated buildings portfolio (Operational Property Portfolio). This includes all Scope 1 and 2 emissions under operational control as defined by the Greenhouse Gas Protocol including landlord areas in housing.

This will support achievement of the following net zero vision and goals:

**NET ZERO VISION:** The City Corporation is responsible for some of Central London's most historic, landmark buildings. The net zero future will prepare them for the next one hundred years, reducing emissions and costs, while improving occupant comfort and productivity.

**NET ZERO GOALS:** City of London Corporation scope 1 and 2 emissions are net zero by 2027 and scope 3 emissions are net zero by 2040.

### Introduction

Modelling completed by Arup in August 2020 identified 2018 baseline Scope 1 and 2 emissions (GHG Protocol operational control) as 36.4 ktCO<sub>2</sub>e. This encompasses all of the Operational Property Portfolio, housing landlord-areas, a small amount of fleet emissions (0.4 ktCO<sub>2</sub>e) and fifteen investment properties (2.3 tCO<sub>2</sub>e). The last two of these sources are addressed under other Project Plans. A breakdown of the Operational Property Portfolio is provided in Appendix 5 which, as per the Arup model, assessed 59 assets, with a total floor area of 829,711m<sup>2</sup>, believed to cover 95% of carbon emissions. This was then scaled up to represent 100% of the portfolio. This also included an assessment of the leakage of refrigerant gases. There is some uncertainty around this data and so this will be investigated in Year 1 as this could potentially become a future action area to address.

The Arup model determined that to achieve net zero by 2027, emissions need to reduce to at least 16.0 ktCO<sub>2</sub>e (a 55% reduction), at which point residual emissions will be sequestered by planned natural capital projects.

Existing planned projects, building stock changes (market consolidation and Fleet Street Estate) and decarbonisation of the UK grid presented in the Arup model predict that the Operational Property Portfolio will reach 14.7 ktCO<sub>2</sub>e by the end of financial year 2026/27 (blue line in Figure 1).

However, this modelling is heavily reliant on the grid decarbonising from 2020 at the pace identified by the Government Green Book. At present, this is considered optimistic when compared to annual figures of average grid emissions as published by the Department for Business, Energy and Industrial Strategy (BEIS) (Figure 2). The latter suggests that, in 2020, grid electricity carbon intensity was 42% more than Green Book emissions factors.

Assuming that grid emissions factors are 42% above the Green Book figures for the period 2020 to 2027, existing planned projects, building stock changes and decarbonisation will result in the Operational Property Portfolio reaching 17.3 ktCO<sub>2</sub>e by the end of financial year 2026/27 (black line in Figure 1). As grid decarbonisation is largely out of the control of The Corporation, this identifies that additional energy efficiency and carbon reduction interventions are needed to mitigate the risk that the grid does not decarbonise quickly. Therefore, a focus of this Project Plan is to deliver carbon reduction interventions within the control of The Corporation to ensure achievement of CAS targets.

A second assumption in the Arup modelling is that the current project pipeline is funded and implemented to contribute towards the 2027 target. Whilst these projects have been identified, focus will need to be maintained on these to ensure they are delivered as intended. This is considered a lower risk than grid decarbonisation as some of these projects have already been delivered, some have funding approved in principle, and others are now included as part of the Salix Public Sector Decarbonisation Scheme (PSDS) £9.5 million grant funding that has been awarded to The Corporation. It should be noted that the PSDS grant funding will support implementation of existing identified, planned projects. The outcomes, data, benefits reporting and delivery approaches from this will be used to inform the future capital programme as outlined in this Project Plan. In order to achieve the 2027 target further projects, which are yet to be identified, will have to be implemented. This is addressed by Task 1a (see Table 1).

The top-down modelling approach completed to date does not provide detail on specific interventions to be implemented on a building/system level. In order to mobilise capital funding, it is critical that additional interventions are identified quickly to deliver projects in the short term. In parallel, whilst quick win projects deemed deliverable now are completed, action is required to identify longer term interventions that mitigate any significant risk of as well as building a platform for achieving the 2040 target.

Against this background, this Project Plan identifies Tasks that have been developed to address the following three aims:

- **Deliverable** – tasks can be completed within the identified timescales;
- **Affordable** – projects can be accommodated within The Corporation's current and future budget constraints; and
- **Impactful** – actions make expected carbon reductions towards both the 2027 and 2040 targets.

To achieve these aims the following high-level actions will be implemented, and these are split it into individual Tasks in Table 1.

#### **Year 1-2**

- Selection of buildings for carbon reduction interventions;
- Identification of specific interventions at selected buildings;
- Dovetailing of identified interventions into existing estates/asset strategy;
- Completion of feasibility studies to enable future capital works;
- Onboarding of resources to deliver Tasks and implement quick wins.

#### **Year 2+**

- Focused procurement and delivery of capital works to achieve carbon reduction targets.

#### **How to use this document**

This document outlines the costs, benefits and overall approach to reducing emissions across the Operational Property Portfolio to support delivery of the Climate Action Strategy. It is to be used as a baseline against which to monitor progress. It will be kept as a live document and will be updated periodically subject to the Change Control Procedure.

Figure 1 – Carbon Reduction Trajectories (Total Scope 1 & 2 emissions) – Arup model August 2020

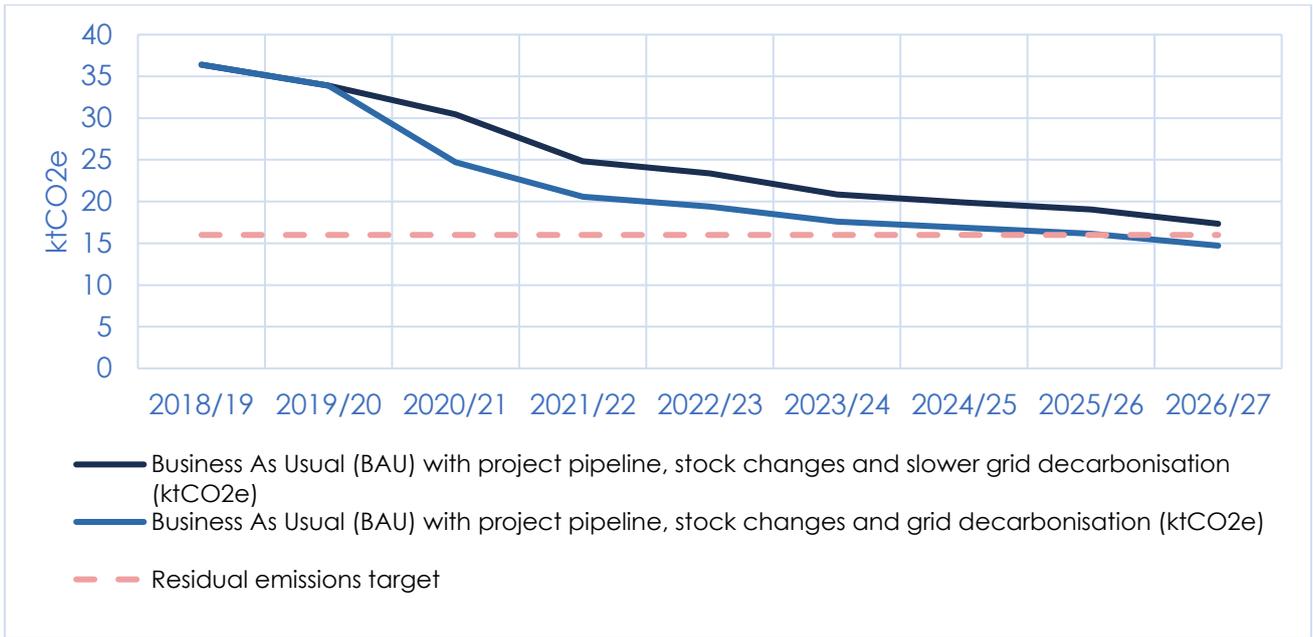


Figure 2 – Comparison of UK grid electricity factors



## Project Objectives

The Project Objectives for this Project Plan are:

- Improve building energy efficiency of the Operational Property Portfolio (commercial and housing – landlord areas);
- Improve cost efficiency and functional performance; and
- Use the Operational Property Portfolio to act as an exemplar to other portfolios in the Square Mile.

The table below details key Tasks that will be completed to achieve the Project Objectives. Further detail on each project can be found in Appendix 1. The focus of the 2021/22 plan will be to mobilise resource to identify and implement interventions in the short term, whilst allowing longer term action to be unlocked through relevant feasibility studies. This will be measured as per the KPIs as identified in Table 8.

It is vital that these Tasks interface with outcomes from the design standard and resilience Action Areas. This will make sure synergies to improve energy efficiency and reduce carbon (e.g. during energy audits) are consistent with the outcomes from these CAS activities. The role of the Sustainability Lead (detailed below) will be to co-ordinate across Action Areas to facilitate this.

Table 1 – Tasks and project objectives

Theme	Ref	Task	Rationale	Outcome	Key Actions in 21/22	Lead	Lead support
<b>Building energy surveys</b>	1a	Commission rolling programme of building energy surveys and feasibility – Operational Property Portfolio commercial assets	Requirement for specific asset-level interventions including quick wins.	Production of a detailed opportunities pipeline with a breakdown of costs and savings by asset.  Integration of action into estates and asset management strategy.	<ul style="list-style-type: none"> <li>• Procurement of Energy Auditor</li> <li>• Completion of Investment Grade energy audits in fifteen most energy intensive assets</li> </ul>	Corporate Property Group Director	Energy Projects Lead
	1b	Commission building energy surveys and feasibility – Operational Property Portfolio housing assets	Requirement for specific interventions including quick wins.	Identification of pilot schemes and funding opportunities in housing assets.	<ul style="list-style-type: none"> <li>• Procurement of consultancy support</li> <li>• Identification of funding opportunities for housing</li> <li>• Identification of pilot schemes to test funding opportunities.</li> </ul>	Assistant Director for Barbican and Property Services	Energy Projects Lead
<b>Building controls</b>	2	Develop building controls management strategy and increase delivery capability	Identification and implementation of quick win demand reduction projects.	Production of BMS development strategy. Increased delivery of building controls related interventions.	<ul style="list-style-type: none"> <li>• Resourcing of 2 x FTE specialist technical resources</li> </ul>	Operations Group Director	Energy Projects Lead
<b>Monitoring and targeting</b>	3	Roll-out monitoring and targeting programme as a platform for occupier engagement	Need to engage building occupiers. Allows progress to be reported.	Enhancement and expansion of the current capabilities and effectiveness of the monitoring and targeting system. Received	<ul style="list-style-type: none"> <li>• Resourcing of 1 x FTE specialist technical resources</li> </ul>	Operations Group Director	Energy & Carbon Manager

Climate Action Strategy: NZ1 Corporate Property and Landlord Areas - Project Plan

Theme	Ref	Task	Rationale	Outcome	Key Actions in 21/22	Lead	Lead support
			Verification of interventions is required to ensure they are performing as planned.				
<b>Decarbonisation of heat</b>	4a	Commission study for decarbonisation of heat: CitiGen	Arup model assumes decarbonisation of CitiGen. This needs to take place to achieve 2027 target.	Identification of a pathway for decarbonising the CitiGen heat network.	<ul style="list-style-type: none"> <li>• Completion of HNDU feasibility study (in progress)</li> </ul>	Operations Group Director	Energy Projects Lead
	4b	Commission study for decarbonisation of heat: Decentralised systems (Commercial)	Gas consumption (non-CitiGen) is 29% of baseline energy consumption.	<p>Identification of a pathway for decarbonising decentralised heating systems.</p> <p>Understanding of the local grid constraints and the impact of electrifying heating systems.</p> <p>Smart grid feasibility study for one site.</p>	<ul style="list-style-type: none"> <li>• Procurement of consultancy support</li> <li>• Completion of feasibility study for decarbonisation of heat.</li> </ul>	Corporate Property Group Director	Energy Projects Lead
	4c	Commission study for decarbonisation of heat: Housing	Gas consumption (non-CitiGen) is 29% of baseline energy consumption.	<p>Identification of a pathway for decarbonising communal housing heating systems.</p> <p>Understanding of the local grid constraints and the impact of electrifying heating systems.</p>	<ul style="list-style-type: none"> <li>• Procurement of consultancy support</li> <li>• Completion of feasibility study for decarbonisation of heat.</li> </ul>	Assistant Director for Barbican and Property Services	Energy Projects Lead
<b>Deep retrofit</b>	5	Commission study for deep fabric retrofit pilot – Operational Property Group commercial asset	Building fabric improvements are required to support low carbon heat technologies e.g. heat pumps	<p>Pilot study for deep fabric retrofit.</p> <p>Understanding costs of deep retrofit</p>	<ul style="list-style-type: none"> <li>• Identify asset with planned refurbishment/major upgrade suitable for this pilot.</li> <li>• Completion of study.</li> </ul>	Corporate Property Group Director	Energy Projects Lead
<b>Staff resource</b>	6	Appoint additional energy specialist resources	<p>Consultancy activities identified above will need to be managed.</p> <p>Recommendation from previous workstreams need to be implemented.</p>	Recruitment of 3 x FTE Energy Project Managers to support delivery	<ul style="list-style-type: none"> <li>• Resourcing of 3 x FTE specialist technical resources</li> </ul>	Corporate Property Group Director	Energy Projects Lead

Climate Action Strategy: NZ1 Corporate Property and Landlord Areas - Project Plan

Theme	Ref	Task	Rationale	Outcome	Key Actions in 21/22	Lead	Lead support
<b>Delivery</b>	<b>7</b>	Capital programme roll-out	Interventions identified in previous Task will need to be implemented across the Operational Property Portfolio.	Delivery of tangible energy and carbon reduction interventions informed by previous workstreams.	<ul style="list-style-type: none"> <li>Implementation of projects identified in Tasks 1-6 with a focus on securing quick wins</li> </ul>	Corporate Property Group Director	Energy Projects Lead

### Team structure

The Teams involved in the delivery of this Project Plan are shown in Figure 3. How this integrates within the wider delivery approach and Buildings Centre of Excellence is explained in more detail in the Delivery Approach Section.

*How additional resources are managed within the City Surveyors Department is shown in*

Figure 4.

The colour coding is as follows:

- Yellow boxes indicate areas of current activity that support the CAS;
- Green boxes show those additional activities required by this Plan that will be unlocked through additional resources;
- The grey boxes indicate additional staff resources either through outsourced team members (e.g. secondments) or third party flexible resource to be employed according to delivery need. As indicated by the legend this is not necessarily permanent employees.

The Team Structure has been developed to focus on the Year 1 and 2 priorities of identifying interventions, completing feasibility studies, specifying and delivering procurement solutions and delivering quick wins. This will likely change as the programme progresses depending on identified procurement routes and service outcomes. For example, outsourced roles could be delivered as part of contracted services, with specific output requirements as part of the service (e.g. as part of an Energy Performance Contract). To make sure that the Team Structure remains fit for purpose, the Senior Responsible Officers and Buildings Chief Officer Group will review and manage resource requirements instilling a flexible approach that allows the market to innovate and deliver The Corporation's requirements efficiently.

Figure 3 – Delivery Teams - NZ1 Corporate Property and Landlord Areas

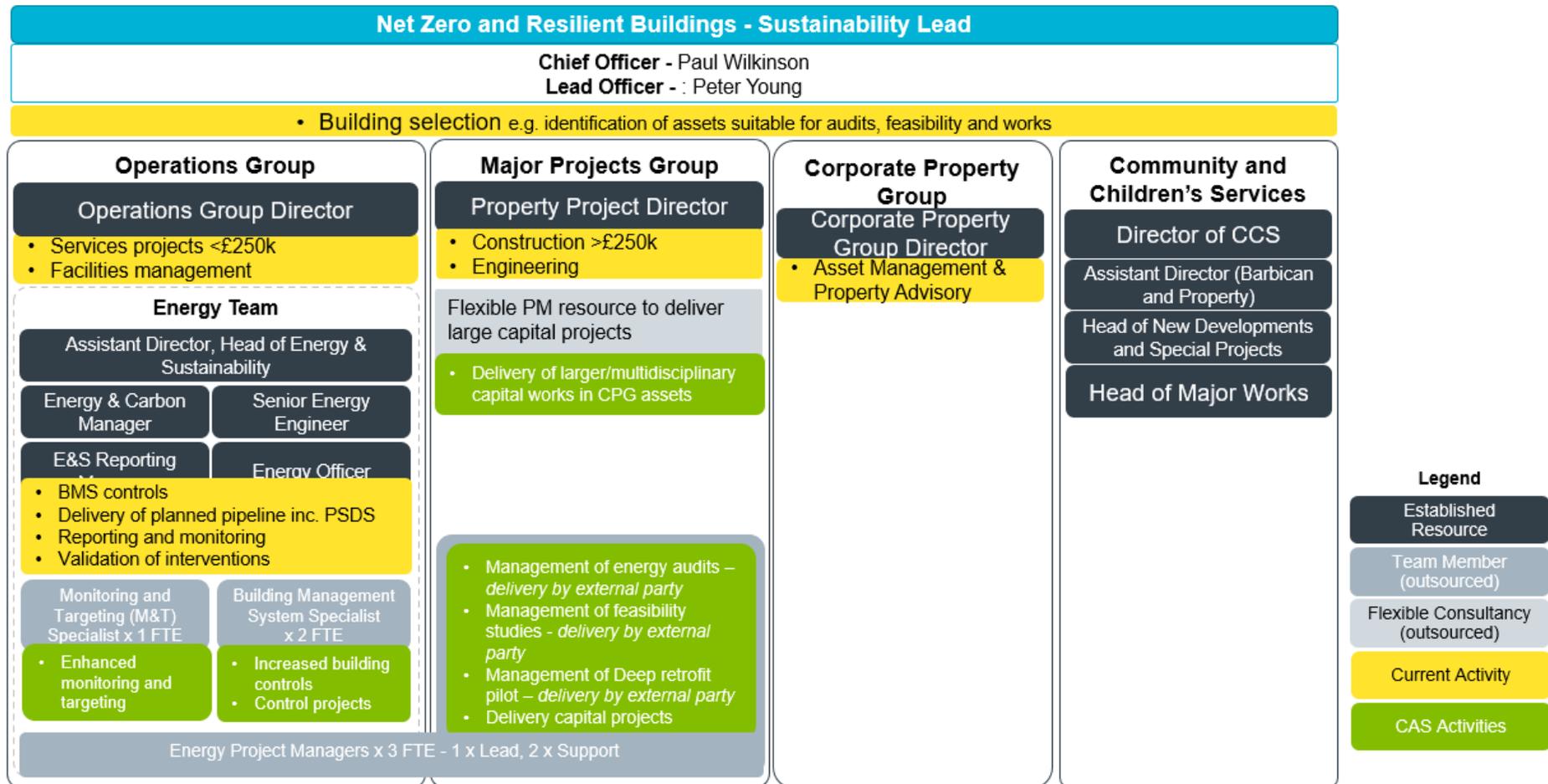
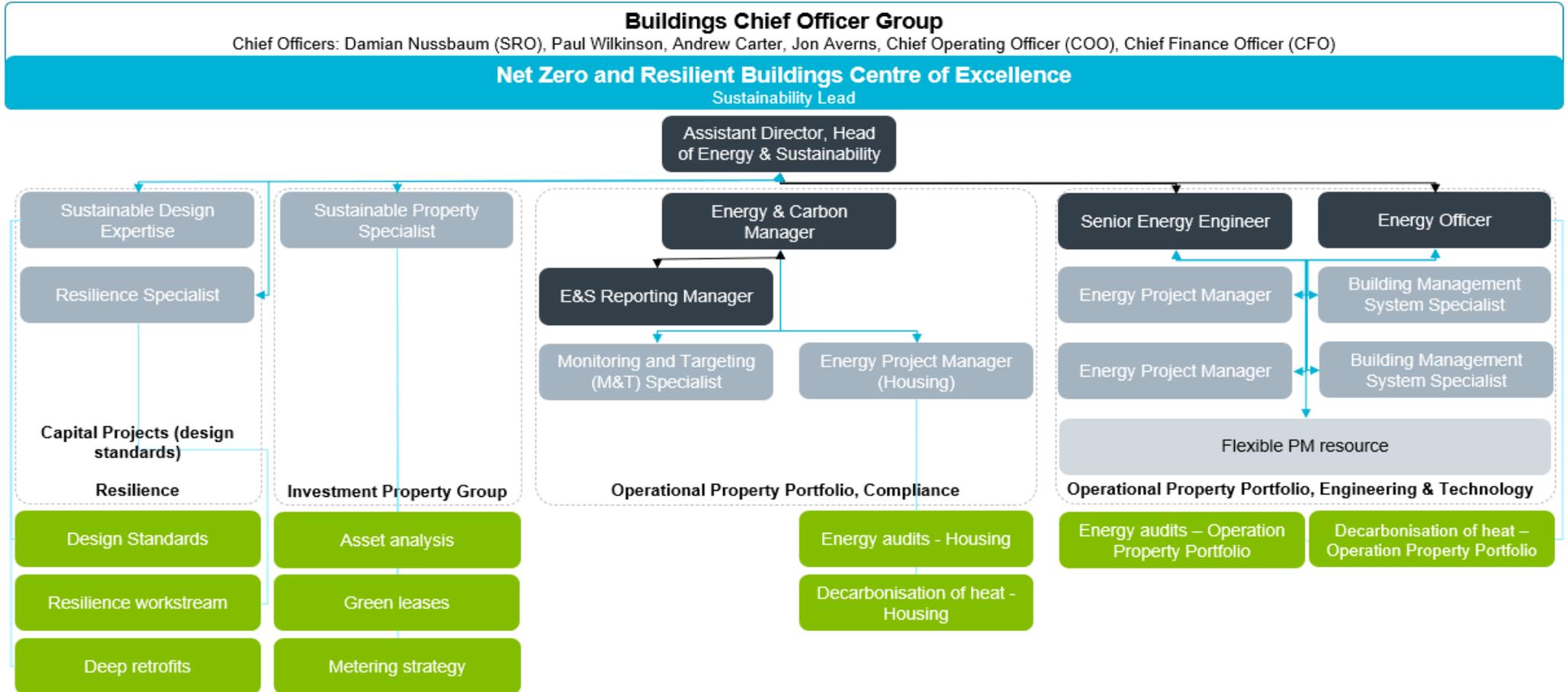


Figure 4 - Team structure - NZ1 Corporate Property and Landlord Areas



## Project Schedule & Gantt Chart

Delivery Plan (Gantt chart)				FY 21/22				FY 22/23				FY 23/24				FY 24/25				FY 25/26				FY 26/27				
Task Number	Task Detail	Responsible	Completion (%)	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	
<b>Net Zero and Resilient Buildings Centre of Excellence</b>																												
CoE-1	Establishment of Net Zero and Resilient Buildings Centre of Excellence	Director of Innovation & Growth, City Surveyor	0%	█																								
CoE-2	Establish energy targets and intensity metrics where data gaps	Director of Innovation & Growth, City Surveyor	0%	█																								
<b>NZ1 Corporate Property and Landlord Areas</b>																												
	Selection of buildings for workstreams CPG-1a and CPG-1b	Corporate Property Group Director	0%	█																								
CPG-1a	Commission building energy surveys – Operational Property Portfolio commercial assets	Corporate Property Group Director	0%		█	█	█																					
CPG-1b	Commission building energy surveys – Operational Property Portfolio housing assets	Corporate Property Group Director	0%		█	█	█																					
CPG-2	Develop building controls management strategy	Corporate Property Group Director	0%		█	█	█																					
CPG-3	Roll-out monitoring and targeting programme	Corporate Property Group Director	0%		█	█	█																					
CPG-4a	Decarbonisation of heat: CitiGen	Corporate Property Group Director	0%		█	█	█	█	█	█	█																	
CPG-4b	Decarbonisation of heat: Decentralised systems (Commercial)	Corporate Property Group Director	0%		█	█	█	█	█																			
CPG-4c	Decarbonisation of heat: Housing	Corporate Property Group Director	0%		█	█	█	█	█																			
CPG-5	Deep fabric retrofit pilot – Operational Property Group commercial asset	Corporate Property Group Director	0%		█	█	█																					
CPG-6	Additional energy specialist resources	Corporate Property Group Director	0%	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
CPG-7	Capital programme roll-out	Corporate Property Group Director	0%			█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█

## Project Business Case

### Project Costs

Total project costs have been ascertained based on a model developed by Arup. This shows that, in addition to planned lifecycle works, a CAPEX envelope of ~£21 million (excluding VAT) is required over the next six years to help achieve net zero carbon for the Operational Property Portfolio. It is important to note that this cost was based on 2018 prices and discounted in line with the Government Green Book Guidance. With the discounting removed, this cost would be significantly more, however, a budget of ~£21 million has been approved for work to be delivered under this CAS Activity. This budget is not index linked to allow for inflation.

These costs do not account for enabling works e.g. local grid reinforcement, rewiring or asbestos removal and therefore funding will have to be identified from separate budgets where required (these have yet to be identified and agreed but could come from CWP, major project bids or local risk). It is also important to note that all costs for resource have been capitalised and therefore come out of this budget. In addition, inflation has not been applied. It is assumed that funding will be available to support workstreams to be mobilised in line with the Project Schedule.

To ensure quick wins/projects deemed deliverable now are completed in the short term, whilst also completing action to unlock longer term interventions, the Tasks and outcomes detailed in Table 1 have been identified. The costs associated with these are presented in Table 2 and Figure 5 below.

As Figure 5 demonstrates, an initial amount of project consultancy support will be required during the earlier years to unlock capital spend in subsequent years by identifying buildings and subsequent interventions in these buildings.

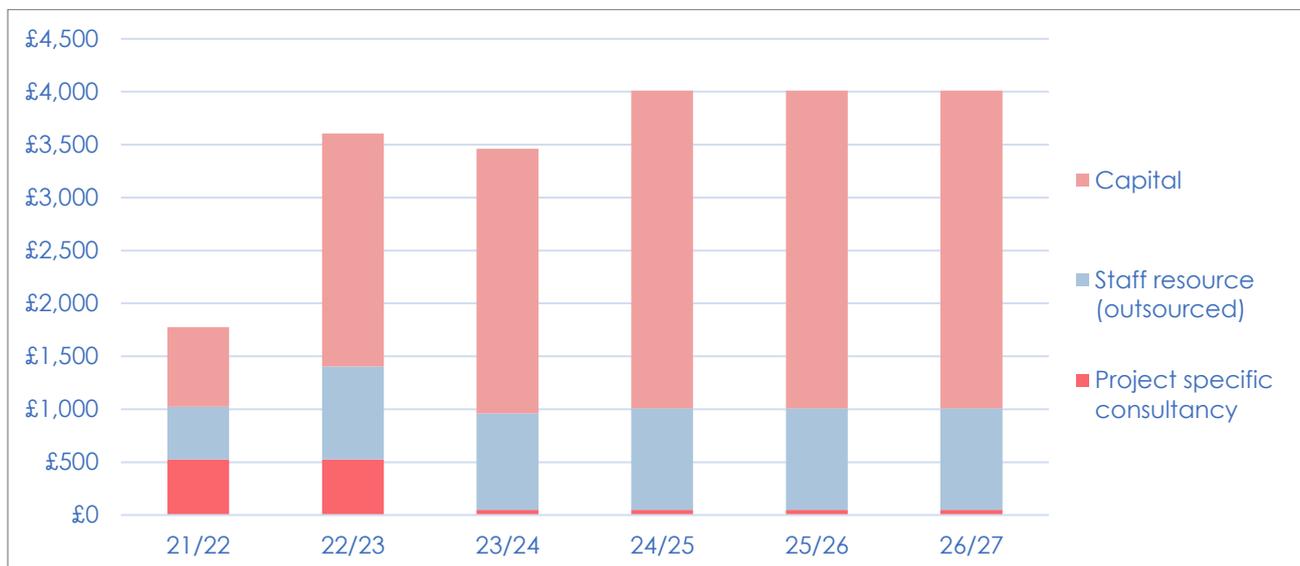
Table 2 – Costs by Task - costs in 2018 prices in line with Arup model and excludes VAT<sup>1</sup>

Tasks	Category	Costs per year (£k/annum)					
		21/22	22/23	23/24	24/25	25/26	26/27
1a - Commission building energy surveys – Operational Property Portfolio commercial assets	Project specific consultancy	£250	£50	£50	£50	£50	£50
1b - Commission building energy surveys – Operational Property Portfolio housing assets	Project specific consultancy	£100	£75	Capital funding dependant			
2 - Develop building controls management strategy	Staff resource (outsourced)	£150	£220	£220	£220	£220	£220
3 - Roll-out monitoring and targeting programme	Staff resource (outsourced)	£55	£110	£110	£110	£110	£110
4a - Decarbonisation of heat: CitiGen	Project specific consultancy	-	£100	Capital funding dependant			
4b - Decarbonisation of heat: Decentralised systems (Commercial)	Project specific consultancy	£50	£120	-	-	-	-
4c - Decarbonisation of heat: Housing	Project specific consultancy	£50	£80	-	-	-	-
5 - Deep fabric retrofit pilot – Operational Property Group commercial asset	Project specific consultancy	£75	£100	-	-	-	-
6 - Additional energy specialist resources	Staff resource (outsourced)	£220	£330	£330	£330	£330	£330
	Staff resource (outsourced)	£75	£220	£250	£300	£300	£300
7 - Capital programme roll-out	Capital	£750	£2,200	£2,500	£3,000	£3,000	£3,000
<b>Total</b>	<b>Project specific consultancy</b>	<b>£525</b>	<b>£525</b>	<b>£50</b>	<b>£50</b>	<b>£50</b>	<b>£50</b>
	<b>Staff resource (outsourced)</b>	<b>£500</b>	<b>£880</b>	<b>£910</b>	<b>£960</b>	<b>£960</b>	<b>£960</b>
	<b>Capital</b>	<b>£750</b>	<b>£2,200</b>	<b>£2,500</b>	<b>£3,000</b>	<b>£3,000</b>	<b>£3,000</b>

<sup>1</sup> At present the budget is not index linked. Capital and resource budgets shown in future years will be less in real terms due to inflation.

<b>Total</b>	<b>£1,775</b>	<b>£3,605</b>	<b>£3,460</b>	<b>£4,010</b>	<b>£4,010</b>	<b>£4,010</b>
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Figure 5 - Costs breakdown by Category (£k/annum)



### Project Benefits

The main quantitative project benefits are expected to be cost and carbon savings. A breakdown of each is provided over the following Section.

#### Cost savings

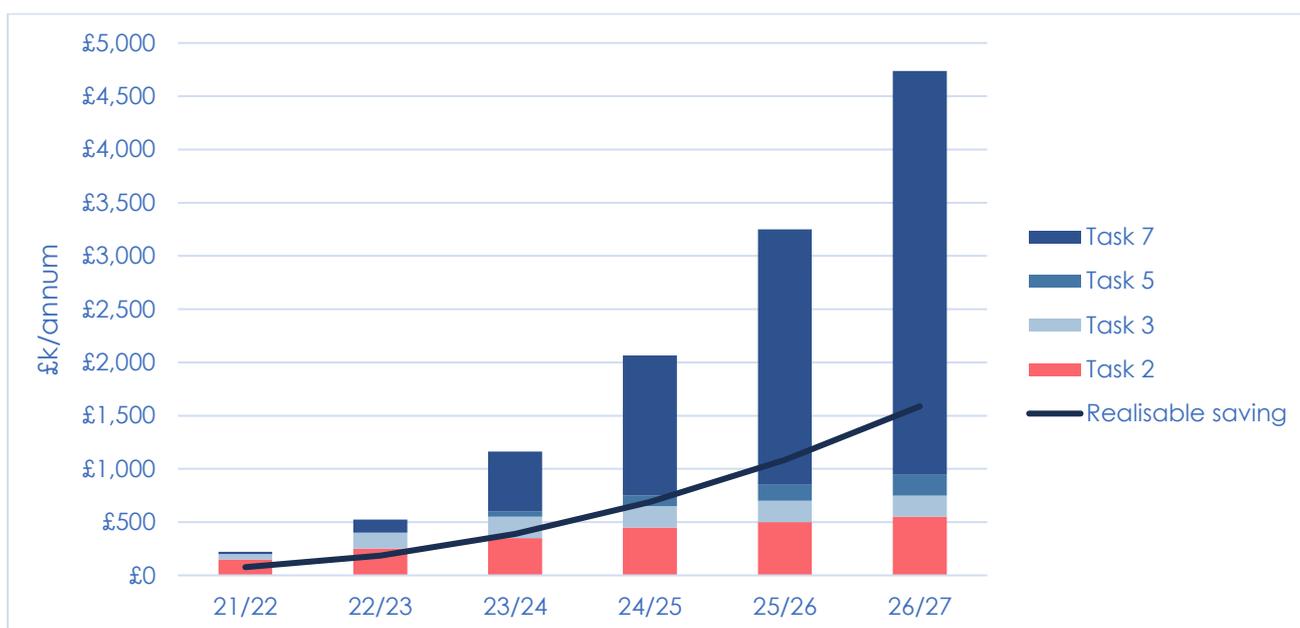
Cost savings have been established by the Energy Team based on the relationship between predicted capital expenditure and increasing intervention paybacks year-on-year as quick wins are achieved and projects with longer paybacks are required in order to achieve the 2027 net zero target.

This analysis was undertaken based on 2018 energy prices. Therefore, they are in line with the base year used in the Arup model. Like project costs, inflation has not been applied.

Table 3 – Total annual cost savings by year by Task (£k/annum), in 2018 prices

Tasks	Year					
	21/22	22/23	23/24	24/25	25/26	26/27
1a - Commission building energy surveys – Operational Property Portfolio commercial assets	<i>Enabling action</i>					
1b - Commission building energy surveys – Operational Property Portfolio housing assets	<i>Enabling action</i>					
2 - Develop building controls management strategy	£150	£250	£350	£450	£500	£550
3 - Roll-out monitoring and targeting programme	£50	£150	£200	£200	£200	£200
4a - Decarbonisation of heat: CitiGen	<i>Enabling action</i>					
4b - Decarbonisation of heat: Decentralised systems (Commercial)	<i>Enabling action</i>					
4c - Decarbonisation of heat: Housing	<i>Enabling action</i>					
5 - Deep fabric retrofit pilot – Operational Property Group commercial asset	-	-	£50	£100	£150	£200
6 - Additional energy specialist resources	<i>Enabling action</i>					
7 - Capital programme roll-out	£20	£125	£564	£1,316	£2,401	£3,786
<b>Total</b>	<b>£220</b>	<b>£525</b>	<b>£1,114</b>	<b>£1,966</b>	<b>£3,101</b>	<b>£4,536</b>
<b>Realisable cost savings</b>	<b>£77</b>	<b>£184</b>	<b>£390</b>	<b>£688</b>	<b>£1,085</b>	<b>£1,588</b>

Figure 6 – Annual cost savings by Task (£k/annum)



### Cost savings realisable to The Corporation

Due to the nature of energy supply arrangements there are instances where reducing energy consumption may not necessarily result in cost savings realisable back to The Corporation. This is where The Corporation does not directly operate and occupy the asset and where tenants are responsible for energy supplies. Examples of this include:

- Markets - stallholders are sub-metered and pay based on their own usage for their area;
- Schools - The Corporation owns the building(s) but schools have their own supply arrangements; and
- Housing - tenants receive the benefit of reduced energy bills when changes are made to communal systems.

In order to account for this, the Energy Team have completed analysis based on actual costs for each Operation Property Portfolio asset between November 2019 and October 2020 to identify, under current arrangements, what proportion of energy spend could potentially be returned to The Corporation. This was found to be, on average, 35% across the whole portfolio. A breakdown of this analysis can be found in Appendix 6. At present this divided into CPG and non-CPG spend only, further work will be undertaken to provide more detail on this including dividing this by building type e.g. schools, housing etc.

*In recognition of this, a factor of 35% has been used to illustrate average realisable savings to The Corporation should interventions be implemented across the whole portfolio in*

Figure 6 and Table 3.

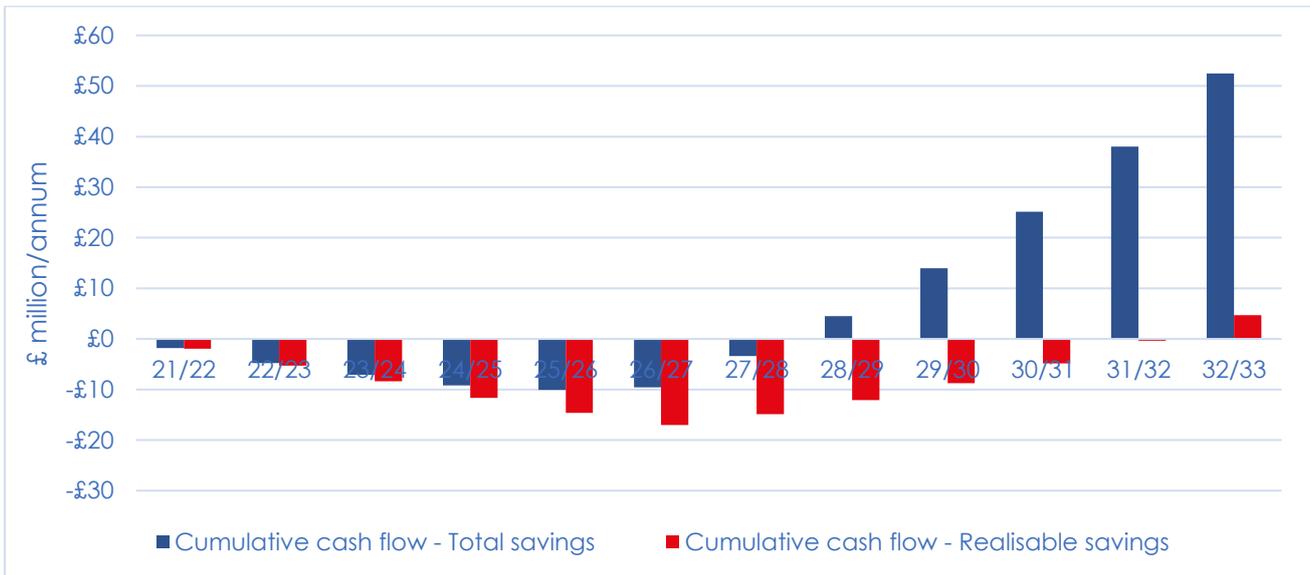
To ensure that potential energy savings are realised back to The Corporation, the initial years of implementation will focus on assets where savings can be returned to the centre. This will be enabled through developing a process for selecting buildings for carbon reduction interventions of which this will be a key factor (see Appendix 7).

For future years, work to identify mechanisms where savings could (in full or part) be returned to The Corporation will be undertaken. This would include looking at savings share agreements, Energy Performance Contracts or supporting stakeholders to secure external funding (e.g. [Salix Energy Efficiency Loans](#) could be suitable in schools).

Cashflow

Based on the costs and savings presented above, Figure 7 shows an indicative cashflow for this Project Plan. Based on total savings, this could give a positive return in 2028/29. Using average realisable savings, this could give a positive return in 2032/33<sup>2</sup>.

Figure 7 – Cumulative cashflow graph (£ million/annum), in 2018 prices, excluding VAT – Negative figures represent net expenditure



Carbon savings

Using expected cost savings, the Energy Team have modelled carbon savings based on the result of implementing the Tasks identified in this Project Plan (figures provided in Table 3). Figure 8 and Figure 9 show this under two scenarios; grid decarbonisation as per emission factors in the Government Green Book, and slower grid decarbonisation assuming a rate 42% above the Government Green Book (see Introduction).

Table 4 – Annual carbon savings from Tasks identified in this plan as established by Energy Team.

Tasks	Year					
	21/22	22/23	23/24	24/25	25/26	26/27
Annual Carbon Savings (ktCO <sub>2</sub> e) – Green Book factors	0.32	0.49	1.27	1.59	1.77	2.14
Annual Carbon Savings (ktCO <sub>2</sub> e) – 42% above Green Book emissions factors	0.39	0.59	1.45	1.82	2.08	2.49

<sup>2</sup> This does not account for rises in energy costs that may be caused by electrifying heat provision. It also does not take into account any cost of enabling works.

Figure 8 illustrates the additional impact of carbon savings identified in this Project Plan against the BAU Scenario in the Arup model using Green Book decarbonisation factors. This estimates that carbon emissions in 2026/27 would be 12.6 ktCO<sub>2e</sub>. This is 3.4 ktCO<sub>2e</sub> below the 16 ktCO<sub>2e</sub> target.

Figure 9 shows the additional impact of carbon savings identified in this Project Plan against the BAU Scenario in the Arup model under slower grid decarbonisation. This estimates that in 2026/27 carbon emissions would be 14.9 ktCO<sub>2e</sub>. This is 1.1 ktCO<sub>2e</sub> below the 16 ktCO<sub>2e</sub> target and provides assurance that if the grid does not decarbonise as quickly as modelled by Arup, the target is achievable based on the actions identified in this Project Plan.

Figure 8 - Carbon Reduction Trajectories (Scope 1&2) – Green Book Scenario

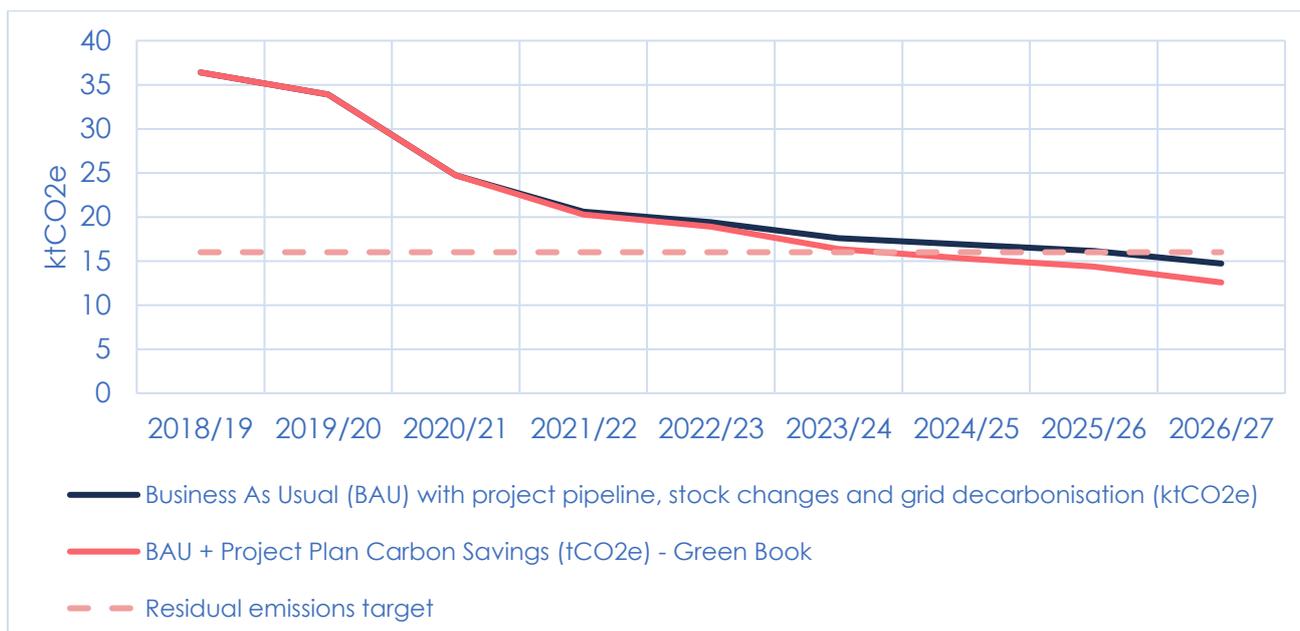
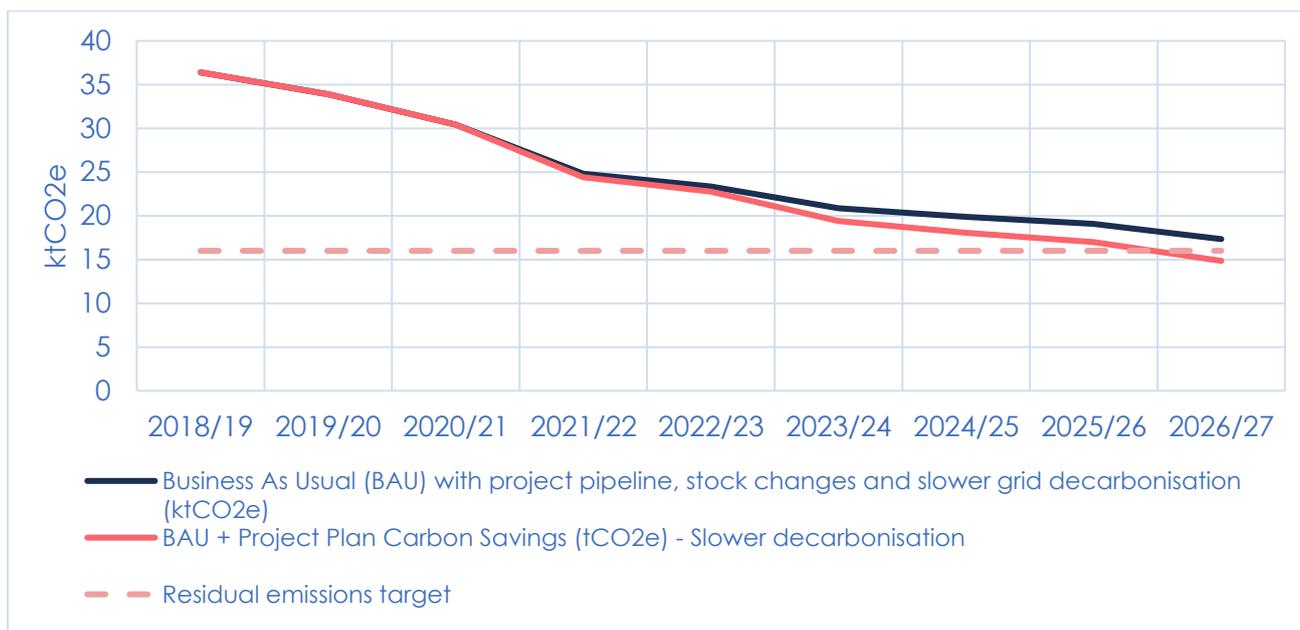


Figure 9 - Carbon Reduction Trajectories (Scope 1&2) – Slower decarbonisation (42% above Green Book figures from 2021)



### Summary of project benefits

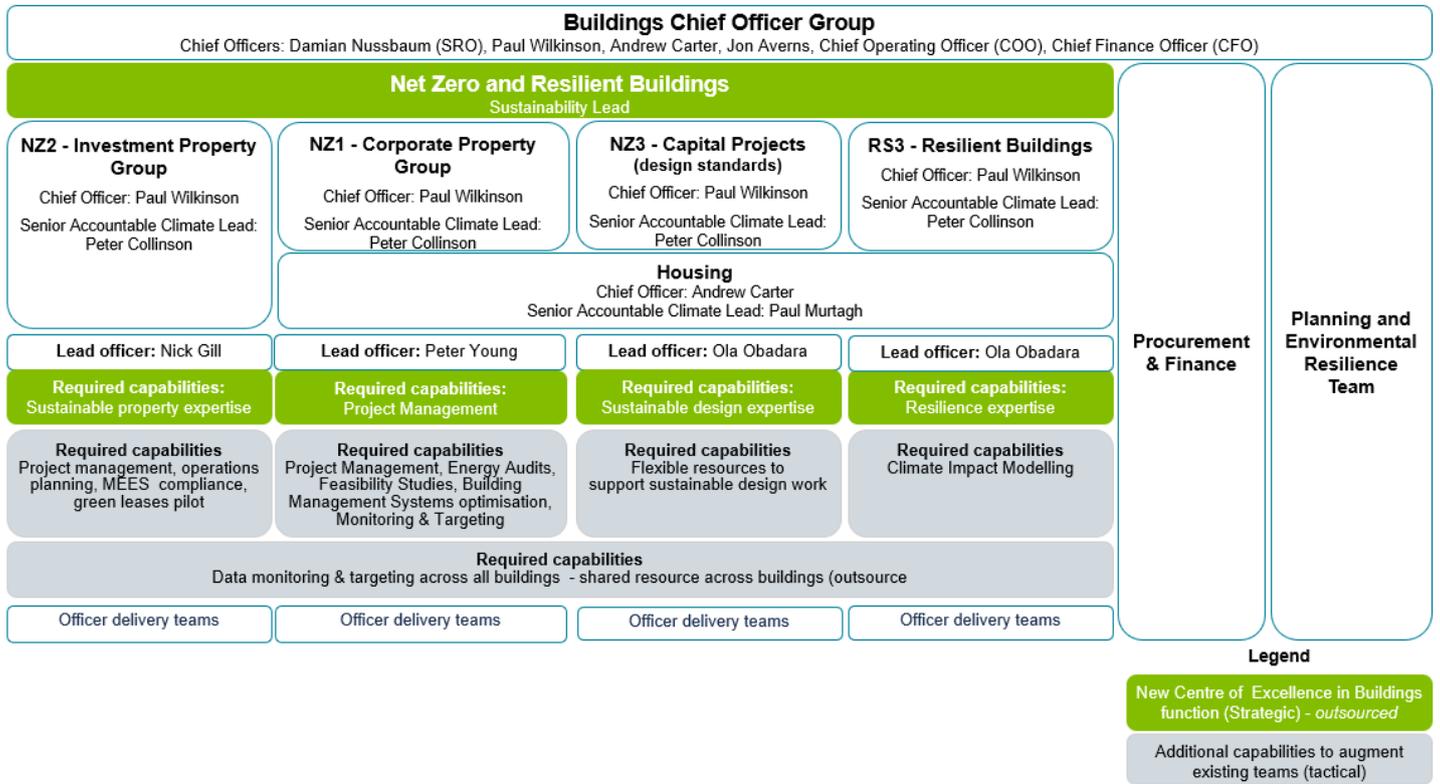
In summary, the following benefits are expected to be achieved from implementing this plan:

- Cost savings
  - Total energy savings - positive cumulative cashflow of £52.4 million (in 2018 prices) in 2032/33.
  - 35% realisable savings - positive cumulative cashflow of £4.6 million (in 2018 prices) in 2032/33.
- Carbon savings
  - Achievement of residual emissions element of net zero target in 2026/27

- Projected carbon emissions of 12.6 ktCO<sub>2</sub>e against 16.0 ktCO<sub>2</sub>e residual emissions target (3.4 ktCO<sub>2</sub>e under) using current Treasury Green Book emissions factors.
- Projected carbon emissions of 14.9 ktCO<sub>2</sub>e against 16.0 ktCO<sub>2</sub>e residual emissions target (1.1 ktCO<sub>2</sub>e under) using a slower gird decarbonisation scenario.
- Additional, non-quantifiable savings (at this stage)
  - Improved access to energy data and a deeper understanding of energy performance at each building (support by BMS and Monitoring Target resources);
  - Improved air quality where gas boilers are avoided or removed;
  - Understanding and positioning for innovative and emerging technologies;
  - Implementation of “no regrets” heat and electricity demand reduction solutions that facilitate future implementation of low carbon heat pump solutions;
  - Understanding of the role that deep retrofit can play in decarbonisation;
  - Improved occupant comfort and internal environment.

# Delivery Approach

Figure 10 – Net Zero and Resilient Buildings Centre of Excellence, Delivery Model



To drive and direct leadership, best practice, research, support and training to all areas of building decarbonisation and resilience work to deliver the CAS, a Net Zero and Resilient Buildings Centre of Excellence will be established. This will sit outside of the regular reporting structure to drive strategic level targets into mobilisation and delivery across departments. Through this approach it will provide a view across all Tasks and Project Plans to control and package up service requirements based on the outputs of feasibility studies, energy audits etc. maximising value from the market based on clear desired outcomes and programme level view.

Its role will include concentrating knowledge from across all activity areas to attain and sustain high performance and value, capture lessons learnt and provide a feedback loop for continuous improvement.

The benefits of this approach will be:

- Member-buy in and confidence;
- Limiting “single points of failure”;
- Development of a cross-discipline team;
- Share resources and learning across workstreams;
- Ability to flex staff resource to meet need;
- Ability to draw in a wide range of expertise and experience from the private sector.

## Net Zero and Resilient Buildings Sustainability Lead

To manage and lead the Net Zero and Resilience Buildings Centre of Excellence, a Sustainability Lead will be resourced who will report to the Buildings Chief Officer Group Senior Responsible Officers. This will allow The Corporation to utilise the third party expertise of someone with extensive experience of delivering large, complex programmes across net zero, resilience and energy in buildings to drive delivery across the four buildings workstreams.

Their role will comprise:

- Managing and leading the Net Zero and Resilience Buildings Centre of Excellence;
- Reporting progress to CAS Senior Responsible Officers;
- Coordinating and identifying synergies between workstreams;
- Aligning strategy and policy with delivery;
- Managing the transition from project definition to mobilisation and implementation;
- Facilitating reach back to private sector expertise and best practice.

### Delivery model

The delivery model for the Net Zero and Resilient Buildings Centre of Excellence is illustrated in Figure 10. This shows how all four workstreams across buildings will come together, identifies the key officers and illustrates the role of additional resource capabilities to support existing teams.

For this Project Plan the key resources are:

- Net Zero and Resilient Buildings Centre of Excellence Sustainability Lead
- Chief Officer – Paul Wilkinson
- Senior Accountable Climate Lead – Peter Collinson
- Lead Officer – Peter Young

The team structure for the Corporate Property Group Action Area is detailed above.

### Approach to staff resourcing

The diagram above shows how the proposed Net Zero and Resilient Buildings Centre of Excellence Sustainability Lead would relate to the four workstreams, including this one.

Whilst this plan identifies staff resource requirements, it is not expected that this will be delivered through new internal hires. This will be delivered through project specific consultancy, outsourced staff and/or flexible project management resources allowing The Corporation to drive value from the supply chain through competitiveness, contractual measures to secure outcomes, flexibility, reach back support and market innovation. This will also inform plans under the current Target Operating Model update. This is expected to be managed as laid out in Figure 3 and Figure 4.

At present, staff resourcing has been developed to address the initial need to identify interventions, complete feasibility studies, deliver quick wins and identify, specify and deliver procurement solutions. As the CAS progresses (informed by Year 1) a key review point will be to evaluate resourcing requirements as this may change depending on the identified procurements routes and service outcomes. For example, procurement of an Energy Performance Contract for items requiring significant investment would potentially require less energy engineering and more contract management expertise. This review will be managed and guided by the Senior Responsible Officers and the Buildings Chief Officer Group.

### Approach to selecting buildings

When determining which buildings should be taken forward for the identification and implementation of carbon reduction interventions there are a number of criteria that need to be considered. These are broadly divided into two categories:

#### Pre-survey

- Does the building offer sufficient scale (in terms of energy use) to warrant intervention?
- Is there sufficient data and metering infrastructure to support the identification and implementation of interventions?

- Are there existing planned activities in the near term (e.g. next 3 years) that offer the opportunity to integrate carbon reduction interventions e.g. major upgrades, lease breaks, refurbishments?
- Are there existing planned refurbishments, reconfigurations or divestments that would make any survey redundant in the near term?
- Is the building of sufficient importance that it is considered meritorious to implement works here?
- How much of the savings could be returned back to The Corporation rather than to tenants?

### **Post survey**

#### Achievability

- Are interventions considered technically and financially viable?
- Are there potential procurement routes available?
- Are there any heritage implications?
- Can the works be scheduled and sequenced with any other planned works in a realistic timeframe?

#### Affordability

- What is the scale of the investment?
- Are the commercial outcomes acceptable to The Corporation?

#### Benefits optimisation

- What is the scale of potential carbon savings and when are they achieved?
- Are cost savings realisable to The Corporation?

In order to select which buildings are to be taken forward for energy audits as per Tasks 1a and 1b and subsequent capital works as per Task 7, a set of selection criteria have been developed to assess buildings both pre and post survey to ascertain those which are suitable for taking forward to implementation. This is provided in Appendix 7.

## Risk Management

Table 5 illustrates the key risks identified for this Project Plan. It is recognised that some of these will be universal across the four building Action Areas. Therefore, it is important that mitigations and solutions are matched up to ensure they are addressed at the programme level.

It is expected that the role of the Sustainability Lead will be to manage these risks across the four Action Areas so that comparative risk analysis can be completed, risks can be stress tested to quantify their impact on meeting carbon targets and mitigations aligned to ensure a holistic approach.

Table 5 – Risk Management, RAID analysis

Ref:	Description	Type (RAID)	Criticality	Proposed mitigation
R-1	Delays in Governance and sign off result in carbon savings being realised later than planned.	Risk	Critical	<ul style="list-style-type: none"> <li>Stakeholder Engagement approach detailed below.</li> <li>Internal Governance requirements to be mapped for Tasks at mobilisation.</li> <li>Reporting cycles to be mapped for Tasks on mobilisation.</li> </ul>
R-2	Interventions are not developed and organised into a deliverable programme which when presented to committees result in delays to action and slippage in the Project Schedule.	Risk	Critical	<ul style="list-style-type: none"> <li>Links to Risk 1.</li> <li>Project Schedule developed (see above).</li> <li>This Project Plan is the Framework against which interventions will be delivered and presented as a whole programme.</li> <li>Mobilisation Phase to support organisation of a deliverable programme.</li> </ul>
R-3	Planned stock changes, particularly building rationalisation, do not happen by 2027.	Risk	Critical	<ul style="list-style-type: none"> <li>Tasks identified in the plan are expected to overdeliver on the reduction target.</li> <li>Ongoing risk management approach to be incorporated in Delivery Approach.</li> <li>The impact of slippage to planned stock changes to be modelled in order to understand the potential impact.</li> </ul>
R-4	Discounted, non-index linked costs as detailed in the existing Arup model, totalling ~£21 million are insufficient to deliver net zero across Operational Property Portfolio assets over the next six years.	Risk	High	<ul style="list-style-type: none"> <li>Opportunities for grant funding to be pursued where available.</li> <li>The option of ring-fencing cost savings to fund future interventions to be explored.</li> </ul>
R-5	Current procurement routes are too slow causing project delay.	Risk	Medium	<ul style="list-style-type: none"> <li>Procurement routes to be considered at mobilisation: this could include Frameworks and existing arrangements.</li> <li>Delivery approach to consider delegated authority allowing rapid release of budget where needed to support rapid procurement.</li> </ul>
R-6	Refrigerant emissions may be higher than assumptions in the Arup model. This will not decarbonise without specific interventions.	Risk	Medium	<ul style="list-style-type: none"> <li>Refrigerant emissions to be reviewed and validated on mobilisation to check data.</li> </ul>
R-7	CitiGen decarbonisation is not complete in line with timescales as of Arup model. In addition, if the grid decarbonises rapidly this may become a carbon source.	Risk	Medium	<ul style="list-style-type: none"> <li>Work underway via HNDU feasibility study.</li> <li>Decarbonisation of CitiGen included as a specific Task.</li> <li>Further analysis of Arup model to understand assumptions made around CitiGen carbon content of district heat and cooling.</li> </ul>

Climate Action Strategy: NZ1 Corporate Property and Landlord Areas - Project Plan

Ref:	Description	Type (RAID)	Criticality	Proposed mitigation
A-1	£21 million funding represents the additional costs of achieving net zero e.g. costs exclude enabling works (e.g. grid reinforcement), asbestos removal, rewiring, etc.	Assumption	High	<ul style="list-style-type: none"> <li>Stakeholder Engagement approach detailed below – it is important this includes Internal Departments where funding for this may have already been allocated.</li> <li>Early engagement with DNO to be included under decarbonisation of heat activities.</li> </ul>
A-2	Of the current ~£21 million for delivery of net zero carbon (see point 2) this is for both capitalised resource <u>and</u> capital works costs. This is split as follows: <ul style="list-style-type: none"> <li>Capital works - ~£14.5 million</li> <li>Resource (capitalised) ~ £6.5 million</li> </ul>	Assumption	Medium	
A-3	Funding model assumes an average realisable saving to The Corporation of 35% of total energy savings. This will vary depending on which buildings interventions are completed in.	Assumption	Medium	<ul style="list-style-type: none"> <li>To be monitored as part of Benefits Realisation</li> <li>Buildings scoped for energy audits will consider where cost savings can be best realised to The Corporation.</li> <li>Options around savings share agreements to be explored.</li> </ul>
A-4	Only landlord areas are included with housing under Scope 1 and 2 emissions.	Assumption	Low	<ul style="list-style-type: none"> <li>Tenant areas to be considered under 2040 target.</li> </ul>
D-1	Grid decarbonisation occurs at a sufficient pace to achieve net zero target.	Dependency	Critical	<ul style="list-style-type: none"> <li>Tasks identified in the plan are expected to overdeliver on the reduction target.</li> <li>Grid decarbonisation to be tracked by Energy Team.</li> <li>Ongoing risk management approach to be incorporated in Delivery Approach.</li> </ul>
D-2	Stock changes result in carbon savings as included in Arup model.	Dependency	High	<ul style="list-style-type: none"> <li>Design Standards Action Area to address the performance of new developments and refurbishment works.</li> </ul>
D-3	Lifecycle works up to 2027 will support achievement of the net zero carbon target e.g. life expired system will be replaced with energy efficient/low carbon alternatives	Dependency	Medium	<ul style="list-style-type: none"> <li>Mitigated through actions in Design Standards Action Area.</li> </ul>

## Stakeholder Engagement

The following table outlines the key stakeholders, how and when we intend to interact with them and what channels will be used.

Table 6 – Stakeholder engagement

Category:	Department / Who	Message	Channels	When
<b>Internal Stakeholders - Department</b>	Chamberlains (Financial) Chamberlains (Procurement) PMO City Surveyors (Chief Officer, CPG, PPG, Energy, Resilience, Climate Team, Building Services Engineers Team and Technical Advisory Group Team) Legal Possibly DBE	Engage, Inform, Consult, Validate	Tried and tested  Climate Chats  Interviews  Team meetings  1:1 meetings	Needs minimum 6 week lead in time before referring to Committee.    Internal liaison through programme and project lifecycles
<b>Internal Stakeholders - Committees</b>	Corporate Project Board Project Sub Committee P&R Committee RASC Court (where complex) Proposed Extraordinary Board Cyclical Works Board Housing Board	Seek Approval	Tried and tested  Committees  Meetings	Gateways 1, 2, combined 3 & 4 (4b where relevant), 5 and 6
<b>External</b>	Funders	Seek Offers, Inform	Regular partnership meetings  Funding opportunities	Concurrent with gateway 4 (RIBA Stage 2, 3, 4, 5 & 6) At required times gateway 2-6
<b>External</b>	Residents Building Users	Engage, Inform, collaborate	Consultation surveys  Interviews  Meetings  Website  Social media	(At required times in RIBA stage 3 and 4 and 5) At required times gateways 3-5
<b>External</b>	Building Managers Facilities Managers	Engage, Seek information, validate, Inform	Interviews  1:1 meetings	(At required times in RIBA stage 2, 3 and 4) At required times gateways 3-6
<b>External</b>	Supply Chains	Engage, seek information, Inform	Consultation  1:1 meetings	RIBA Stage 1, 2, 3, 4, 5 and 6 At required times gateways 2-6
<b>External</b>	External Consultants (design) and Contractors (surveys, design and works)	Engage, Seek Information, collaborate, commission	Consultation  Partnership meetings	RIBA Stage 1, 2, 3, 4, 5 and 6 At required times gateways 1-6
<b>External</b>	Distribution Network Operator	Engage, Consult, Collaborate	Regular partnership meetings	Concurrent with gateway 4 (RIBA Stage 2, 3, 4, 5 & 6) At required times gateway 2-6

			Engaged through decarbonisation of heat Tasks.	
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## Reporting cycle

It is assumed that projects will evolve from the master programme of works. It is envisaged that projects will, in the majority, follow the 'regular' project route but some may fall under the 'complex' route. The table below identifies reporting envisaged along with intended reporting benefits:

Table 7 – Reporting cycle

Category:	When	Benefit Realised
<b>Internal Stakeholders (Internal Departments)</b>	Throughout project lifecycle, Gateways	Obtaining advice and feedback. Output monitoring Governance Checks
<b>Internal Stakeholders (Buildings Chief Officer Group (BCOG))</b>	Throughout project lifecycle, Gateways via the Programme Function and progress to KPIs via the CAS Dashboard	Commitment 2: To support the creation of a consistent format and content for effective progress reporting at monthly Chief Officer Group and quarterly Committee meetings from 1 April 2021.
<b>Internal Stakeholders (Committees)</b>	Gateways 1, 2, combined 3 & 4 (4b where relevant), 5 and 6	Tracking and monitoring of project outputs and objectives. Escalation of issue management. Seeking project direction required. Governance Checks
<b>External (Funding)</b>	Concurrent with gateway 4 (RIBA Stage 2, 3, 4, 5 & 6) At required times gateway 2-6	Known funding outcomes. Progress reporting against funding elements incl. tracking of progress Lessons learned from other projects or best practice
<b>External (Residents &amp; Users)</b>	(At required times in RIBA stage 3 and 4 and 5) At required times gateways 3-5	Keeping all informed and engaged Informing of methodologies and outputs intended – Involving residents and user's ideas Informing of methodologies and outputs intended – Involving residents and users by allowing people to voice their views Informing of methodologies and outputs intended – how people can play their part. Positive reputational image
<b>External (Building Managers and FM)</b>	(At required times in RIBA stage 2, 3 and 4) At required times gateways 3-6	In-depth knowledge sharing Lessons learning – what works and what works less than envisaged Watch Points sharing - Specific building usage / information that could help or hinder projects.
<b>External (Supply chains)</b>	RIBA Stage 1, 2, 3, 4, 5 and 6 At required times gateways 2-6	Gathering market intelligence and information Complying with Statutory consents
<b>External (Consultants &amp; Contractors)</b>	RIBA Stage 1, 2, 3, 4, 5 and 6 At required times gateways 1-6	Obtaining advice. Receiving specialist design knowledge and sharing. Specific technological information and expertise. Additional resource to assist existing teams.
<b>External (Distribution Network Operator)</b>	Concurrent with gateway 4 (RIBA Stage 2, 3, 4, 5 & 6) At required times gateway 2-6	Identify the viability of proposed interventions and any required enabling works. Understanding of impact on project timescales and costs. Specific technological information and expertise.

## Project Controls

The following Key Performance Indicators (KPIs) will be defined and tracked by this Project in order to judge its overall delivery success. Each will be tracked on a quarterly basis for qualitative (initially) and move toward quantitative progress reporting and will be reported formally in the Annual Report each year starting FY22/23.

### Project-level Key Performance Indicators (KPIs)

The below table sets out the principal KPIs that will track the delivery of the four CAS headline targets listed below. A trajectory and set of milestone target dates are to be developed for each.

1. Net zero by 2027 in the City Corporation’s operations
2. Net zero by 2040 across the City Corporation’s full value chain
3. Net zero by 2040 in the Square Mile
4. Climate resilience in our buildings, public spaces and infrastructure

Reporting KPIs are intended to be refreshed as part of the annual cycle of baseline re-assessment work beginning in FY22/23. The Management KPIs will be refreshed more regularly and will be reported via the Climate Performance Dashboard to committees from FY21/22.

Table 8 – Key performance indicators (KPI)

Theme	KPI name	Definition	Relevant CAS target	Regularity of reporting
Carbon	Scope 1 & 2 emissions	Reduction in Scope 1 & 2 emissions GHG Protocol operational control	Net zero by 2027 in the City Corporation’s operations	Quarterly
			Net zero by 2040 in the City Corporation’s operations	
Energy	Energy consumption kwh/m <sup>2</sup> floor area*	Energy use in kilowatt hours per gross internal floor area	Net zero by 2027 in the City Corporation’s operations	Quarterly
	Energy Performance Certificates (EPC)*	Weighted average EPC for whole portfolio	Net zero by 2027 in the City Corporation’s operations	
			Net zero by 2040 in the City Corporation’s operations	Annually

\*Once reporting processes have been established for these KPIs it is intended that additional targets will be developed to help drive improvement. Where possible this will be split out by building archetype/use to provide more focused targets where needed. Responsibility for this is expected to fall under the role of the Sustainability Lead who will manage a data maturity strategy (see below).

### Key data and information

Documentation and process controls will be improved to allow for future audit and quality assurance measures such as alignment to best practice international standards on climate reporting.

The Sustainability Lead will develop a data maturity strategy to increase data accuracy and completeness, ensure integration of key data across key workstreams and provide clear data governance and performance management going forward. This will also include data and information requirements that will extend to any outsourced work to provide assurance on quality. For example, this could include that energy audits are aligned against ISO 50002:2014/ BS EN 16247-1:2012 standards.

As this project progresses data will be generated as to the effectiveness of carbon reduction interventions. Further KPIs and targets may be periodically linked to the efficacy of measures and their overall contribution to the CAS. This will be subject to the Change Control Procedure.

The data generated by this project will be collated and displayed through Power BI dashboards to improve accessibility and understanding for a range of audiences.

### Internal Governance

- Net Zero and Resilient Buildings Centre of Excellence to report to Buildings Chief Officer Group;
- Action Area Chief Officers and Senior Accountable Climate Leads to report to Buildings Centre of Excellence;
- Lead officers to report to Action Area Chief Officer and Senior Accountable Climate Lead;
- Proposed Project Board (Extraordinary Board) where required for cost and progress updates under the holistic Capex cost allowance;
- Internal Stakeholders (all gateway reports) - informal project updates and formal gateways reports ahead of submission to Committees.

## APPENDIX 1

### Task breakdowns

<b>Task</b>	<b>1a - Commission building energy surveys and feasibility – Operational Property Portfolio commercial assets</b>																																																							
<b>Outcome</b>	Production of a detailed opportunities pipeline with a breakdown of costs and savings by asset.																																																							
<b>Responsible officer</b>	Corporate Property Group Director																																																							
<b>Description</b>	<p>A detailed list of project and resource driven opportunities is required to mobilise investment (Task 8). This will supplement the current top-down approach in the existing Arup model by detailing specific interventions by asset, with a breakdown of costs and savings, enabling specification to enable prioritisation and procurement mobilisation. It is assumed that this will be focused on demand reduction as decarbonisation of heat will be picked up by Tasks 4.</p> <p>This Task will use technical consultancy to identify specific interventions, on the building level, across Operational Property Portfolio assets to produce investment grade-level energy audits. This will include detailed survey work, analysis and production of business cases for individual plant and systems. It is expected that all audits will be completed in a standardised fashion, e.g. aligned against ISO 50002:2014/ BS EN 16247-1:2012, to allow outcomes to be compared across Tasks and Project Plans. This should also include a standardised, consolidated table of all interventions to provide a portfolio-wide view which will inform potential procurement and commercialisation approaches.</p> <p>Outputs will also need to identify how interventions can be dovetailed into existing estate and asset strategies to make sure that works are programmed in a coordinated manner.</p> <p>Surveys will also capture data and address any data gaps in refrigerant losses/ top up. If there are assets with significant refrigerant losses or refrigerants with high greenhouse warming potentials this will need to be identified and addressed within the capital works programme.</p> <p>A matrix for selecting buildings has been developed to help identify which will be taken forward for the initial phases of this work (see Appendix 7).</p>																																																							
<b>Timescales</b>	<p><b>Year 1</b> – The Energy Team have selected the fifteen most energy intensive assets where the carbon and benefit and potential are most material for survey and feasibility in Year 1.</p> <p><b>Year 2-6</b> – Rolling programme of energy surveys and feasibility. Assets will be selected annually based on energy performance, asset lifetime, planned refurbishment dates and potential value of savings.</p> <p>For further breakdown see Gantt Chart (Project Schedule).</p> <p><u>Key dependencies</u></p> <p>None.</p>																																																							
<b>Costs (2018 prices, excl. VAT)</b>	<table border="1"> <thead> <tr> <th></th> <th colspan="6">Year</th> </tr> <tr> <th>Cost - £k</th> <th>21/22</th> <th>22/23</th> <th>23/24</th> <th>24/25</th> <th>25/26</th> <th>26/27</th> </tr> </thead> <tbody> <tr> <td><i>Project specific consultancy</i></td> <td>£250</td> <td>£50</td> <td>£50</td> <td>£50</td> <td>£50</td> <td>£50</td> </tr> <tr> <td><i>Staff resource (outsourced)</i></td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td><b>Resource</b></td> <td><b>£250</b></td> <td><b>£50</b></td> <td><b>£50</b></td> <td><b>£50</b></td> <td><b>£50</b></td> <td><b>£50</b></td> </tr> <tr> <td><b>Capital</b></td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td><b>TOTAL</b></td> <td><b>£250</b></td> <td><b>£50</b></td> <td><b>£50</b></td> <td><b>£50</b></td> <td><b>£50</b></td> <td><b>£50</b></td> </tr> </tbody> </table>								Year						Cost - £k	21/22	22/23	23/24	24/25	25/26	26/27	<i>Project specific consultancy</i>	£250	£50	£50	£50	£50	£50	<i>Staff resource (outsourced)</i>	-	-	-	-	-	-	<b>Resource</b>	<b>£250</b>	<b>£50</b>	<b>£50</b>	<b>£50</b>	<b>£50</b>	<b>£50</b>	<b>Capital</b>	-	-	-	-	-	-	<b>TOTAL</b>	<b>£250</b>	<b>£50</b>	<b>£50</b>	<b>£50</b>	<b>£50</b>	<b>£50</b>
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<b>Benefits</b>	<p>Identification of specific interventions for selected assets, supplementing existing top-down approach in Arup model.</p> <p>Enabling action for savings realised in Task 7.</p>																																																							
<b>Assumptions</b>	<ul style="list-style-type: none"> <li>Survey costs identified by the Energy Team.</li> <li>Costs are higher in Year 1 due to the size and complexity of the plant and systems in the fifteen most energy intensive assets.</li> </ul>																																																							

<b>Task</b>	<b>1b - Commission building energy surveys – Operational Property Portfolio housing assets</b>						
<b>Outcome</b>	Identification of pilot schemes and funding opportunities in housing assets.						
<b>Responsible officer</b>	Corporate Property Group Director						
<b>Description</b>	<p>The existing Arup decarbonisation model considers carbon emissions from landlord areas only. In order to reach net zero, The Corporation will need to address housing emissions, including that of social housing tenants and private residents. To enable this, it is expected that Year 1 and 2 will focus on identifying interventions, funding opportunities and pilot studies to test solutions which will unlock action in future years.</p> <p>This Task will use technical consultancy to identify specific interventions, on the asset level, across housing assets to produce an action plan. This will include a desktop review, survey work, analysis and production of net zero operating plan, particularly for landlord areas. Given the immediate focus on net zero for Scope 1 and 2 emissions by 2026/27 this is expected to focus on communal areas but can be flexible to align with external funding opportunities. Where emissions are under the control of landlords, reducing energy in housing may also lead to additional benefits for tenants e.g. through reduced heating bills where communal systems exist.</p> <p>Outputs will also need to identify how interventions can be dovetailed into existing estate and asset strategies to make sure that works are programmed in a coordinated manner. In addition, opportunities for financing options such as those identified by the <a href="#">Green Finance Initiative</a> should be identified to support future delivery. It is expected that all audits will be completed in a standardised fashion, e.g. aligned against ISO 50002:2014/ BS EN 16247-1:2012, to allow outcomes to be compared across Tasks and Project Plans. This should also include a standardised, consolidated table of all interventions to provide a portfolio-wide view which will inform potential procurement and commercialisation approaches.</p> <p>A matrix for selecting buildings has been developed to help identify which will be taken forward for the initial phases of this work (see Appendix 7). It is recognised that ongoing work from Savills is looking at EPCs across the housing stock. This will be used to feed into the building selection of housing assets.</p>						
<b>Timescales</b>	<p><b>Year 1-2</b> – Identification of pilot schemes and funding opportunities.</p> <p><b>Year 3-6</b> – Capital funding dependent.</p> <p>For further breakdown see Gantt Chart (Project Schedule).</p> <p><u>Key dependencies</u></p> <p>None.</p>						
<b>Costs (2018 prices, excl. VAT)</b>	<b>Year</b>						
	<b>Cost - £k</b>	<b>21/22</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>25/26</b>	<b>26/27</b>
	<i>Project specific consultancy</i>	£100	£75	<i>Capital funding dependant</i>			
	<i>Staff resource (outsourced)</i>	-	-	-	-	-	-
	<b>Resource</b>	<b>£100</b>	<b>£75</b>	<b>Capital funding dependant</b>			
	<b>Capital</b>	-	-	-	-	-	-
	<b>TOTAL</b>	<b>£100</b>	<b>£75</b>	<b>Capital funding dependant</b>			
<b>Benefits</b>	Enabling action for savings realised in Task 7.						
<b>Assumptions</b>	<ul style="list-style-type: none"> <li>This work will be informed by the desk-based portfolio study currently underway.</li> </ul>						

<b>Task</b>	<b>2 – Develop building controls management strategy and increase delivery capability</b>
<b>Outcome</b>	<p>Production of Building Management Strategy (BMS) development strategy.</p> <p>Increased delivery of buildings' controls related interventions.</p>

<b>Responsible officer</b>	Corporate Property Group Director						
<b>Description</b>	<p>Additional expert resource is required to identify, deliver and maintain the Building Management Software and associated hardware.</p> <p>Building controls are a key component of any energy management strategy and often provide a quick return on investments compared to other intervention types. The Energy Team have already made c. £0.5 million in energy related cost savings between 2018 and 2020 from this, and it is expected that increased and sustained resource will further increase and maintain these savings going forward.</p> <p>This Task will support and be supported by the energy audits in Task 1 and lead to the identification of quick wins for implementation in Year 1.</p> <p>See: APPENDIX 2 - Job role – Building Management System (BMS) Specialist.</p>						
<b>Timescales</b>	<p><b>Year 1</b> – Employment of 2 x FTE specialist technical resources.</p> <p>For further breakdown see Gantt Chart (Project Schedule).</p> <p><u>Key dependencies</u></p> <p>None.</p>						
<b>Costs (2018 prices, excl. VAT)</b>		<b>Year</b>					
	<b>Cost - £k</b>	<b>21/22</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>25/26</b>	<b>26/27</b>
	<i>Project specific consultancy</i>	-	-	-	-	-	-
	<i>Staff resource (outsourced)</i>	£150	£220	£220	£220	£220	£220
	<b>Resource</b>	<b>£150</b>	<b>£220</b>	<b>£220</b>	<b>£220</b>	<b>£220</b>	<b>£220</b>
	<b>Capital</b>	-	-	-	-	-	-
	<b>TOTAL</b>	<b>£150</b>	<b>£220</b>	<b>£220</b>	<b>£220</b>	<b>£220</b>	<b>£220</b>
<b>Benefits</b>	<p>Enabling action for identifying and managing future capital and operational projects e.g. automated demand response.</p> <p>Benefits expected to meet or exceed costs from Year 1.</p>						
	<b>21/22</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>25/26</b>	<b>26/27</b>	
<b>Annual energy cost savings - £k</b>	£150	£250	£350	£450	£500	£550	
<b>Assumptions</b>	<ul style="list-style-type: none"> <li>Assumed average cost of £110k/annum/FTE for this resource level.</li> <li>Resources to start four months into Year 1, hence costs of £150k.</li> </ul>						

<b>Task</b>	<b>3 – Roll-out monitoring and targeting programme as a platform for occupier engagement</b>
<b>Outcome</b>	Enhancement and expansion of the current capabilities and effectiveness of the monitoring and targeting system.
<b>Responsible officer</b>	Corporate Property Group Director
<b>Description</b>	<p>Roll-out monitoring and targeting programme as a platform for occupier engagement. This includes development of an energy database with associated dashboard(s) to support stakeholder communications.</p> <p>See: APPENDIX 3 – Job Role - Monitoring and Targeting (M&amp;T) Specialist.</p>
<b>Timescales</b>	<p><b>Year 1</b> – Employment of 1 x FTE specialist technical resources.</p> <p>For further breakdown see Gantt Chart (Project Schedule).</p> <p><u>Key dependencies</u></p> <p>None.</p>

Costs (2018 prices, excl. VAT)	Year						
	21/22	22/23	23/24	24/25	25/26	26/27	
<b>Cost - £k</b>							
<i>Project specific consultancy</i>	-	-	-	-	-	-	
<i>Staff resource (outsourced)</i>	£55	£110	£110	£110	£110	£110	
<b>Resource</b>	<b>£55</b>	<b>£110</b>	<b>£110</b>	<b>£110</b>	<b>£110</b>	<b>£110</b>	
<b>Capital</b>	-	-	-	-	-	-	
<b>TOTAL</b>	<b>£55</b>	<b>£110</b>	<b>£110</b>	<b>£110</b>	<b>£110</b>	<b>£110</b>	
<b>Benefits</b>	Enabling action for tenant communications and engagement. Identification of quick win interventions. Improved access to data and identification of anomalies as they occur. Benefits expected to meet or exceed costs from Year 1 (based on total savings).						
		<b>21/22</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>25/26</b>	<b>26/27</b>
	<b>Annual energy cost savings - £k</b>	£50	£150	£200	£200	£200	£200
<b>Assumptions</b>	<ul style="list-style-type: none"> <li>Assumed average cost of £110k/annum/FTE for this resource level.</li> <li>Resources to start six months into Year 1, hence costs of £50k.</li> </ul>						

<b>Task</b>	<b>4a - Commission study for decarbonisation of heat: CitiGen</b>
<b>Outcome</b>	Identification of a pathway for decarbonising the CitiGen heat network, moving away from gas fired CHP to low carbon heat sources.
<b>Responsible officer</b>	Corporate Property Group Director
<b>Description</b>	<p>Fossil fuel carbon contribution is a significant part of The Corporation's carbon footprint. This will remain static and become a larger proportion of total emissions as decarbonisation of the grid progresses. Therefore, decarbonisation of heat feasibility studies are required to identify alternative low carbon heat sources, highlight potential costs and savings and enable specification to support prioritisation and procurement mobilisation.</p> <p>For this Task, the feasibility study should consider both extension to the current CitiGen network (and connection of additional loads) as well as the decarbonisation of the energy centre. This will include identifying new technologies, moving away from gas CHP as soon as practicable, and options to utilise waste heat.</p> <p>Whilst CitiGen is owned and managed by EON, The Corporation will work with them as the core customer and in accordance with the co-operation agreement to work in partnership to deliver a solution.</p> <p>It is understood that CitiGen are progressing plans to install water-source heat pumps at the existing energy centre, using boreholes. This work is fully funded by EON, at zero capital cost to The Corporation. In addition, a Heat Networks Delivery Unit (HNDU) study is currently underway to look at extending the network. This is expected to be completed in early 2021. This can then be developed into further feasibility and a commercial proposition.</p>
<b>Timescales</b>	<p><b>Year 1</b> – Completion of HNDU feasibility study (£16.5k contribution by The Corporation committed)</p> <p><b>Year 2</b> – Further feasibility after HNDU study.</p> <p>Future studies may include different opportunities dependent on the result of the HNDU study. This could include Borough-wide masterplanning, specific area masterplanning, feasibility for specific heat recovery opportunities and energy centre development, more detailed study on system transformation to ambient loop (including on-site heat pumps), customer secondary side temperature optimisation.</p>

<b>Costs (2018 prices, excl. VAT)</b>	<b>Year 3-6 – Detailed Project Development and Commercialisation – Capital funding dependant</b>						
	For further breakdown see Gantt Chart (Project Schedule).						
	<u>Key dependencies</u>						
	Existing HDU feasibility study.						
		<b>Year</b>					
	<b>Cost - £k</b>	<b>21/22</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>25/26</b>	<b>26/27</b>
	<i>Project specific consultancy</i>	-	£80	<i>Capital funding dependant</i>			
<i>Staff resource (outsourced)</i>	-	-	-	-	-	-	
<b>Resource</b>	-	<b>£80</b>	<b>Capital funding dependant</b>				
<b>Capital</b>	-	-	-	-	-	-	
<b>TOTAL</b>	-	<b>£80</b>	<b>Capital funding dependant</b>				
<b>Benefits</b>	<p>Use of HNDU funding in Year 1.</p> <p>Improved air quality where gas boilers are avoided or removed.</p> <p>Removal of fossil fuels from heat systems.</p> <p>Opportunity to position for future funding e.g. <a href="#">Heat Networks Investment Project (HNIP)</a>, upcoming Green Heat Networks Fund.</p>						
<b>Assumptions</b>							

<b>Task</b>	<b>4b - Commission study for decarbonisation of heat : Decentralised systems (Commercial)</b>
<b>Outcome</b>	Identification of a pathway for decarbonising decentralised heating systems, moving away from gas fired boilers to low carbon heat sources.
<b>Responsible officer</b>	Corporate Property Group Director
<b>Description</b>	<p>Fossil fuel carbon contribution is a significant part of The Corporation’s carbon footprint. This will remain static and become a larger proportion of total emissions as decarbonisation of the grid progresses. Therefore, decarbonisation of heat feasibility studies are required to identify alternative low carbon heat sources, highlight potential costs and savings and enable specification to support prioritisation and procurement mobilisation.</p> <p>For this Task, the feasibility study should review Operational Property Portfolio assets (commercial) to identify the opportunities to decarbonise existing gas fired boiler systems with low carbon alternatives when current installations reach their end of life. Based on the Arup Operational Report (August 2020) this is likely to comprise replacing gas fired boilers with either:</p> <ul style="list-style-type: none"> <li>• Low temperature heat pumps - where fabric and terminal devices are suitable for low flow/return temperatures <u>or</u> where fabric retrofits and terminal device retrofits have taken place.</li> <li>• High temperature heat pump - this may be a preferred option when a deep retrofit of the building is not possible and terminal devices cannot be altered for reasons such as cost and/or planning - likely for many older, listed buildings.</li> </ul> <p>Feasibility studies will need to consider key constraints including space requirements, planning (noise, visual impact), existing electrical infrastructure and existing lifecycle plans.</p> <p>Given that the large scale move towards electrification of heating systems, particularly via heat pumps, will require additional connections to the distribution network, the impact of this will need to be assessed to determine if there is available capacity or if local upgrades will be necessary.</p> <p>Once projects have been identified, early engagement with the District Network Operator (DNO) will confirm whether the proposed location has adequate capacity to meet the new demand or whether upgrades and reinforcement is required to increase capacity for existing transformers, distribution lines and cables, etc. As costs for any grid network investments will vary depending on the local situation,</p>

	<p>work will be required to ascertain costs (where required) and the impact on project viability and timescales.</p> <p><b>Smart grid feasibility</b></p> <p>As the UK increases the amount of low-carbon but intermittent renewable generation and the electrification of heat and transport, smart grid technologies including battery storage and automated demand response can to help balance supply and demand across the energy system. Furthermore, coupling this with time of use tariffs (current example in the Domestic sector includes the Octopus Agile tariff) means that there may be financial savings by using electricity at the cheaper times of day, and not during hours of peak demand.</p> <p>This Task will include identification of one commercial asset to review the viability of Smart Grid solutions to explore how it can support the shaving of peak demand and provide stability to the grid. This will be linked to a site with known local grid constraints as identified in activities above.</p>																																																
	<p><b>Timescales</b></p> <p><b>Year 1-2</b> – Completion of feasibility study for decarbonisation of heat.</p> <p>For further breakdown see Gantt Chart (Project Schedule).</p> <p><u>Key dependencies</u></p> <p>Informed by Task 1</p>																																																
<b>Costs (2018 prices, excl. VAT)</b>	<table border="1"> <thead> <tr> <th rowspan="2">Cost - £k</th> <th colspan="6">Year</th> </tr> <tr> <th>21/22</th> <th>22/23</th> <th>23/24</th> <th>24/25</th> <th>25/26</th> <th>26/27</th> </tr> </thead> <tbody> <tr> <td><i>Project specific consultancy</i></td> <td>£50</td> <td>£50</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td><i>Staff resource (outsourced)</i></td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td><b>Resource</b></td> <td><b>£50</b></td> <td><b>£50</b></td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td><b>Capital</b></td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td><b>TOTAL</b></td> <td><b>£50</b></td> <td><b>£50</b></td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> </tbody> </table>	Cost - £k	Year						21/22	22/23	23/24	24/25	25/26	26/27	<i>Project specific consultancy</i>	£50	£50	-	-	-	-	<i>Staff resource (outsourced)</i>	-	-	-	-	-	-	<b>Resource</b>	<b>£50</b>	<b>£50</b>	-	-	-	-	<b>Capital</b>	-	-	-	-	-	-	<b>TOTAL</b>	<b>£50</b>	<b>£50</b>	-	-	-	-
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	<b>Capital</b>	-	-	-	-	-	-																																										
<b>TOTAL</b>	<b>£50</b>	<b>£50</b>	-	-	-	-																																											
<b>Benefits</b>	<p>Improved air quality where gas boilers are avoided or removed.</p> <p>Removal of fossil fuels from heat systems.</p> <p>Enabling action for savings realised in Task 7.</p> <p>Early identification of additional project costs and risks.</p> <p>Understanding and positioning for innovative and emerging technologies.</p>																																																
<b>Assumptions</b>	<ul style="list-style-type: none"> <li>To be informed by Task 1, Year 1 outputs</li> <li>Site monitoring and targeting (Task 3) will be sufficient to allow analysis for Smart Grid project.</li> </ul>																																																

<b>Task</b>	<b>4c - Commission study for decarbonisation of heat : Housing</b>
<b>Outcome</b>	Identification of a pathway for decarbonising housing communal heating systems, moving away from gas fired boiler to low carbon heat sources.
<b>Responsible officer</b>	Corporate Property Group Director
<b>Description</b>	<p>Fossil fuel carbon contribution is a significant part of The Corporation’s carbon footprint. This will remain static and become a larger proportion of total emissions as decarbonisation of the grid progresses. Therefore, decarbonisation of heat feasibility studies are required to identify alternative low carbon heat sources, highlight potential costs and savings and enable specification to support prioritisation and procurement mobilisation.</p> <p>For this Task, the feasibility study should review Housing assets to identify the opportunities to decarbonise existing heating systems with low carbon alternatives when current installations reach their end of life. It is expected that this will include identifying whether existing decentralised systems are suitable for connection to heat networks (see 4a) or can be swapped with low carbon alternatives.</p> <p>Feasibility studies will need to consider key constraints including space requirements, planning (noise, visual impact), existing electrical infrastructure and existing lifecycle plans as well as tenant engagement.</p>

	<p>Given that the largescale move towards electrification of heating systems, particularly via heat pumps, will require additional connections to the distribution network. The impact of this will need to be assessed to determine if there is available capacity or if local upgrades will be necessary.</p> <p>Once projects have been identified, early engagement with the District Network Operator (DNO) will confirm whether the proposed location has adequate capacity to meet the new demand or whether upgrades and reinforcement is required to increase capacity for existing transformers, distribution lines and cables etc. As costs for any grid network investments will vary depending on the local situation, work will be required to ascertain costs (where required) and the impact on project viability and timescales.</p> <p>It is recognised that a sperate piece of work is looking at the major refurbishment of the Barbican Residential Estate (electrically heated). Therefore, this Task may not look at this property to avoid duplication. This will be ascertained early in the Task mobilisation to avoid unnecessary delays to this study commencing.</p> <p>Whilst this plan focuses on Scope 1 and 2 emissions (non-tenant emissions), reducing energy in housing may also lead to additional benefits for tenants e.g. through reduced heating bills where communal systems exist. Furthermore, where opportunities exist to align with external funding opportunities which may cover tenant areas, this will be considered under this task.</p>																																																						
	<p><b>Timescales</b></p> <p><b>Year 1</b> – Completion of feasibility study.</p> <p>For further breakdown see Gantt Chart (Project Schedule).</p> <p><u>Key dependencies</u></p>																																																						
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<i>Project specific consultancy</i>	£50	£50	-	-	-	-																																																	
<i>Staff resource (outsourced)</i>	-	-	-	-	-	-																																																	
<b>Resource</b>	<b>£50</b>	<b>£50</b>	-	-	-	-																																																	
<b>Capital</b>	-	-	-	-	-	-																																																	
<b>TOTAL</b>	<b>£50</b>	<b>£50</b>	-	-	-	-																																																	
<p><b>Benefits</b></p> <p>Improved air quality where gas boilers are avoided or removed.</p> <p>Removal of fossil fuels from heat systems.</p> <p>Enabling action for savings realised in Task 7.</p>																																																							
<p><b>Assumptions</b></p> <ul style="list-style-type: none"> <li>In the majority of cases tenants are responsible for their energy bills. Therefore, work to decarbonise heat in Housing may not result in cost savings directly realisable to The Corporation unless the systems are already in the control of the landlord and/or paid through a service charge e.g. electric underfloor heating at the Barbican Estate</li> </ul>																																																							

<b>Task</b>	<b>5 - Commission study for deep fabric retrofit pilot - Operational Property Group commercial asset</b>
<b>Outcome</b>	Pilot study for deep fabric retrofit, providing insight into capital costs, identification of its role in achieving net zero carbon and opportunities for lessons learnt.
<b>Responsible officer</b>	Corporate Property Group Director
<b>Description</b>	Initial progress toward decarbonising Operational Property Portfolio assets will likely be achieved through improvements in monitoring (Task 3), controls (Task 2) and replacement of equipment (Task 1). However, to achieve net zero carbon, deeper fabric retrofits are likely to be required to enable the implementation of low temperature heat systems. This will involve additional measures from relatively low-cost, “quick-win” interventions such as draught proofing, loft insulation and cavity wall insulation to the more difficult double/triple or secondary glazing, floor insulation (underfloor or solid floor) and solid wall insulation.

<b>Timescales</b>	An initial study at a pilot site will be completed to identify interventions, associated capital costs and savings, related specification(s) and business case for broader roll-out. This will include a review of industry sources to build on existing work and identification potential funding support (e.g. <a href="#">Retrofit Accelerator – Homes</a> ).						
	<p><b>Year 1</b> – Identification of existing/planned projects to complete study on.</p> <p><b>Year 2</b> – Take learnings from Year 1 to complete deep retrofit project.</p> <p>For further breakdown see Gantt Chart (Project Schedule).</p> <p><u>Key dependencies</u></p> <p>None.</p>						
<b>Costs (2018 prices, excl. VAT)</b>		<b>Year</b>					
	<b>Cost - £k</b>	<b>21/22</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>25/26</b>	<b>26/27</b>
	<i>Project specific consultancy</i>	£75	£100	-	-	-	-
	<i>Staff resource (outsourced)</i>	-	-	-	-	-	-
	<b>Resource</b>	<b>£75</b>	<b>£100</b>	-	-	-	-
	<b>Capital</b>	-	-	-	-	-	-
	<b>TOTAL</b>	<b>£75</b>	<b>£100</b>	-	-	-	-
<b>Benefits</b>	Enabling action for roll out of deep retrofit and spending of Capital as per Task 8.						
	Insight into the capital and carbon costs/savings of a deep retrofit project.						
	Benefits expected to exceed costs from Year 5.						
	<b>21/22</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>25/26</b>	<b>26/27</b>	
<b>Annual energy cost savings - £k</b>	-	-	£50	£100	£150	£200	
<b>Assumptions</b>	<ul style="list-style-type: none"> <li>Study to be completed in Year 1 and 2 to unlock savings from Year 3.</li> <li>Capital budget for deep retrofit works to be identified and approved following the study.</li> </ul>						

<b>Task</b>	<b>6 – Appoint additional energy specialist resources</b>						
<b>Outcome</b>	Recruitment of 3 FTE Energy Project Managers						
<b>Responsible officer</b>	Corporate Property Group Director						
<b>Description</b>	Recruitment of additional energy specialists will form the core of the extended team to lead Tasks identified above, co-ordinate consultancy activity and support departments in the delivery of carbon reduction interventions						
	See: APPENDIX 4: Job Role – Energy Project Managers.						
<b>Timescales</b>	<b>Year 1</b> – Employment of 3 x FTE specialist technical resources.						
	<p><u>Key dependencies</u></p> <p>None.</p>						
<b>Costs (2018 prices, excl. VAT)</b>		<b>Year</b>					
	<b>Cost - £k</b>	<b>21/22</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>25/26</b>	<b>26/27</b>
	<i>Project specific consultancy</i>	-	-	-	-	-	-
	<i>Staff resource (outsourced)</i>	£220	£330	£330	£330	£330	£330
	<b>Resource</b>	<b>£220</b>	<b>£330</b>	<b>£330</b>	<b>£330</b>	<b>£330</b>	<b>£330</b>
	<b>Capital</b>	-	-	-	-	-	-

	<b>TOTAL</b>	<b>£220</b>	<b>£330</b>	<b>£330</b>	<b>£330</b>	<b>£330</b>	<b>£330</b>
<b>Benefits</b>	Enabling action for identifying and managing future capital and operational projects. Enabling action for savings realised in Task 7.						
<b>Assumptions</b>	<ul style="list-style-type: none"> <li>Assumed average cost of £110k/annum/FTE for this resource level.</li> <li>Resources to start four months into Year 1, hence costs of £220k.</li> </ul>						

<b>Task</b>	<b>7 – Capital programme roll-out (including flexible project management resource)</b>						
<b>Outcome</b>	Delivery of tangible energy and carbon reduction interventions informed by previous workstreams. Project gateway dashboard monitoring progress						
<b>Responsible officer</b>	Corporate Property Group Director						
<b>Description</b>	<p>Following on from delivery of the Tasks identified above, this Task will involve the deployment of carbon reduction interventions across the Operational Property Portfolio.</p> <p>This includes provision for a Project Management (PM) resource at 10% of capital cost, resourced flexibly from a third party. Part of the PM role will be to produce and manage a Project Gateway Dashboard, displaying key performance indicators pertaining to specific Tasks and projects as well as overall performance, milestone and resource tracking and risks and issues.</p> <p>Following the identification of interventions and completion of feasibility assessments, the opportunity to accelerate delivery and bring capital spend will be considered to maximise carbon and costs savings.</p>						
<b>Timescales</b>	<p><b>Year 1</b> – Employment of PM resource and implementation of projects identified in Tasks 1-7.</p> <p><b>Year 2-6</b> – Rolling capital programme of interventions based on Tasks 1-7.</p> <p><u>Key dependencies</u></p> <p>Findings and outputs from Tasks 1-7.</p>						
<b>Costs (2018 prices, excl. VAT)</b>		<b>Year</b>					
	<b>Cost - £k</b>	<b>21/22</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>25/26</b>	<b>26/27</b>
	<i>Project specific consultancy</i>	-	-	-	-	-	-
	<i>Staff resource (outsourced)</i>	£75	£220	£250	£300	£300	£300
	<b>Resource</b>	<b>£75</b>	<b>£220</b>	<b>£250</b>	<b>£300</b>	<b>£300</b>	<b>£300</b>
	<b>Capital</b>	£750	£2,200	£2,500	£3,000	£3,000	£3,000
	<b>TOTAL</b>	<b>£825</b>	<b>£2,420</b>	<b>£2,750</b>	<b>£3,300</b>	<b>£3,300</b>	<b>£3,300</b>
<b>Benefits</b>	<p>Carbon savings</p> <p>Cost savings</p> <p>Visibility on progress to net zero by 2027.</p>						
	<b>21/22</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>25/26</b>	<b>26/27</b>	
<b>Energy cost savings - £million</b>	£0.02	£0.13	£0.56	£1.3	£2.4	£3.8	
<b>Assumptions</b>	<ul style="list-style-type: none"> <li>Costs run up to Year 6 only.</li> <li>£750k in Year 1 (Capital) is likely to be spent at the end of the year following identification of quick wins during Task 1.</li> <li>PM resource at 10% of total capital cost</li> <li>Total costs up to Year 6 are £21 million as taken from the Arup Model. This is CAPEX only. The Energy Team have capitalised some of the £21 million for non-capital activities (e.g. resource time for energy audits, BMS specialist etc.). This is partly due to the budget for resource not being approved. Any budget remaining after the identified resource tasks has been assigned to the capital programme roll out Capital figure.</li> <li>All costs and savings exclude VAT and are in 2018 prices.</li> </ul>						

## **APPENDIX 2 - Job role – Building Management System (BMS) Specialist**

### **Job purpose**

The role of the BMS Specialist is to ensure the effective operation of The Corporation's Building Management Systems, providing expert knowledge, guidance and support in its future development and to ensure the safe and timely completion of planned and reactive maintenance. This includes the deployment of cost-effective energy management initiatives to drive environmental improvement, energy reduction and operational excellence.

The post holder will work closely with the Energy Team, engineers and building managers to deliver continued support of building services, ensuring minimum down time, increased efficiency and end user satisfaction.

### **Main duties and responsibilities**

- Provide expert knowledge, guidance and leadership in the development of the BMS.
- Lead and direct internal staff and contractors in the planned, preventative and reactive maintenance of the BMS and any system or software upgrades.
- Complete fault diagnosis and rectification on the whole range of BMS equipment.
- Identify potential systems software and hardware issues that may lead to unnecessary failure of services, thereby minimising risk, disruption and inconvenience to building users.
- Keep abreast of technical developments particularly associated with new technology in building engineering services and building management and in all aspects of the mechanical and electrical disciplines and to contribute to departmental engineering policies.
- Train Maintenance Teams, Heating Engineers, trades and other staff in the operation and use of the BMS and metering systems.
- Respond to and resolve Helpdesk work requests.
- Escalate issues found during maintenance requiring capital investment, e.g. replacement items following repeat maintenance visits.
- Coordinate, track and manage the optimisation and repairs of systems controlled by the BMS.
- Identify, evaluate and support the deployment of energy management initiatives.

### **Qualifications**

- Have completed a recognised engineering building services apprenticeship/training programme in an HVAC or Electrical discipline.
- Qualified to at least Level 3 NVQ Diploma in Building Services related discipline.
- Member of CIBSE or equivalent (desirable)

### **Experience**

- Demonstrable post training experience in the maintenance, repair, installation and fitting of BMS/ automated controls.
- Experience of safely working on a variety of installations, appliances and equipment.
- Suitable/relevant IT skills in Building Management Systems
- Practical knowledge of building related Health and Safety legislation applicable to electrical services (i.e. COSHH, PUWER Electricity at Work Regulations).
- Practical experience of identifying and implementing energy conservation/carbon reduction interventions.

## **APPENDIX 3 – Job Role - Monitoring and Targeting (M&T) Specialist**

### **Job purpose**

The role of the Monitoring and Targeting (M&T) Specialist is to enhance and expand the current capabilities and effectiveness of the monitoring and targeting system. This includes monitoring utility use and associated costs, development of an energy database with associated dashboard(s) and supporting stakeholder communications thereby reducing The Corporation's environmental impact.

### **Main duties and responsibilities**

- Performance targets and reporting:
  - Undertake regular reporting against performance targets with issues flagged to the Energy Team.
  - Develop internal reporting processes and ensure that data is available to engage stakeholders in energy conservation.
  - Provide regular reports of use / cost against forecast with appropriate graphs / commentary.
- Benchmarking
  - Work to ensure Display Energy Certificates (DEC's) are up to date and use data that reflects actual energy use within a building.
  - Undertake benchmarking of buildings against internal and industry standards with data normalised to cost per m<sup>2</sup>.
- Metering and exceptions:
  - Ensure that a meter list is maintained, and that all meters are functioning.
  - Identify anomalies in energy use from energy profiles and log issues.
- Projects
  - Produce reports on viability and progress of energy saving measures.
  - Maintain an up to date list of projects affecting energy use and flag any issues to the Energy Team.
  - Manage small environmental projects (such as metering programmes).

### **Qualifications**

- Evidence of strong numerical and statistical analysis skills.
- A degree level qualification in a relevant discipline and evidence of continuing professional development, or experience and evidence of professional development where no degree is held.
- Certified Measurement & Verification Professional (CMVP) (desirable).

### **Experience**

- Experience of managing an Energy Bureau or other energy monitoring and targeting software for the purposes of bill validation and energy monitoring / targeting.
- Experience of energy forecasting, monitoring and exception reporting combined with proactive analytical / investigation skills.
- Understanding / experience of ISO 50001 Energy Management Systems, CIBSE TM39 Building Energy Metering and a working knowledge of Building Management Systems (BMS).
- Understanding of Measurement and Verification techniques, particularly The International Performance Measurement and Verification Protocol (IPMVP).

## **APPENDIX 4: Job Role – Energy Project Managers**

### **Job purpose**

The role of the Energy Project Managers will be to lead on, and support, activities to deliver carbon reduction across The Corporation's Operational Property Portfolio. They will provide technical expertise to inform work programmes, co-ordinate consultancy activity, procure and deliver minor works and work closely with management and officers within The Corporation's directorates, providing specialist expertise in the operational application of energy/carbon reduction interventions.

### **Main duties and responsibilities**

- Support delivery of the Climate Action Strategy.
- Initiate, develop, manage and support design and delivery of projects which enable decarbonisation of The Corporation's energy and buildings.
- Provide climate change and sustainability technical support on buildings and energy projects to other officers across The Corporation's directorates.
- Project manage the development and implementation of specific project work packages, adopting project management practices and engaging with internal and external partners and stakeholders as required.
- Set up and maintain systems for controlling and updating project and programme documentation, ensuring information is up to date and can be readily retrieved.
- Ensure project and programme management information is produced in a clear, concise and timely fashion for internal and external bodies.
- Monitor and control expenditure, employing financial systems to monitor spend for projects leading on.
- Work with the Energy Team, partners and internal stakeholders to share data and insight that enables others to act on the Climate Action Strategy.
- Build relationships, awareness and support for energy and buildings decarbonisation initiatives, projects, and campaigns within The Corporation and with key external stakeholders.

### **Qualifications**

- A degree level qualification in a relevant discipline and evidence of continuing professional development, or experience and evidence of professional development where no degree is held.
- Member of appropriate professional body e.g. IMEA, Energy Institute (desirable).

### **Experience**

- Experience of producing and implementing technical solutions to decarbonise buildings, improve energy efficiency and install renewables.
- Experience of working within a project team to implement defined projects to agreed outputs and agreed deadlines.
- Experience of using project and programme management techniques.
- Experience of managing external consultant and contractor teams to deliver projects.
- Good interpersonal skills with experience of working with a wide range of organisations and stakeholders.

## APPENDIX 5 – Operational Property Portfolio – 2018 baseline

Building ID:	Floor Area / m <sup>2</sup>	Property Use
Guildhall Complex	64,352	Non-residential Institutions – Others
Barbican Arts Centre	70,292	Assembly and Leisure
London Central Market (Smithfield)	75,035	Wholesale Markets
Central Criminal Court	38,553	Non-residential Institutions – Others
Streetlighting	-	Streetlighting
City of London Freeman's School	24,410	Non-residential Institutions – Education
Avondale Square Estate	36,497	Residential Institutions - Gas Heating
Middlesex Street Housing Estate	23,678	Residential Institutions - Gas Heating
Billingsgate Market	14,399	Wholesale Markets
Golden Lane Leisure Centre & Crescent House	2,689	Assembly and Leisure
York Way Housing Estate	17,166	Residential Institutions - Gas Heating
Bishopsgate Police Station	10,864	Non-residential Institutions – Others
City of London School	19,745	Non-residential Institutions – Education
GSMD - Milton Court	18,106	Non-residential Institutions – Education
BEO Shakespeare Tower	17,762	Residential Institutions - Electric Heating
BEO Lauderdale Tower	18,415	Residential Institutions - Electric Heating
BEO Ben Johnson	21,728	Residential Institutions - Electric Heating
City of London School For Girls	10,653	Non-residential Institutions – Education
BEO Cromwell Tower	17,504	Residential Institutions - Electric Heating
City of London Crematorium	12,884	Non-residential Institutions – Others
BEO Andrews House	15,377	Residential Institutions - Electric Heating
BEO Defoe House	15,800	Residential Institutions - Electric Heating
GSMD	10,796	Non-residential Institutions – Education
BEO Willoughby	14,134	Residential Institutions - Electric Heating
Tower Bridge	1,686	Assembly and Leisure
Mansion House	8,236	Assembly and Leisure
Wood Street Police Station - <i>sold and vacating June 2021</i>	11,075	Non-residential Institutions – Others
BEO Thomas More	13,198	Residential Institutions - Electric Heating
21 New Street - <i>short term leasehold</i>	8,282	Business
Walbrook Wharf Cleansing Depot	13,718	Non-residential Institutions – Others
New Spitalfields Market (Landlords)	36,217	Wholesale Markets
BEO Speed House	9,977	Residential Institutions - Electric Heating
BEO Seddon House	8,267	Residential Institutions - Electric Heating
London Metropolitan Archives	14,467	Assembly and Leisure
BEO Gilbert House Switchroom	9,187	Residential Institutions - Electric Heating
BEO John Trundle Court	6,477	Residential Institutions - Electric Heating
Open Spaces Epping Forest	17,207	Open Spaces
Open Spaces Hampstead Heath Leisure	2,051	Open Spaces
BEO Mountjoy House	7,054	Residential Institutions - Electric Heating
GSMD - Sundial Court	4,724	Assembly and Leisure
BEO Breton House	6,109	Residential Institutions - Electric Heating
BEO Bunyan Court	6,050	Residential Institutions - Electric Heating
Snowhill Police Station - <i>sold in 2020</i>	3,731	Non-residential Institutions – Others

Building ID:	Floor Area / m <sup>2</sup>	Property Use
Animal Reception Centre	1,487	Business
Tower Hill Coach & Car Park	7,978	Car Park
Sydenham Hill Estate	11,702	Residential Institutions - Gas Heating
Sir John Cass Foundation School	3,077	Non-residential Institutions – Education
BEO Wallside & Postern	1,849	Residential Institutions - Electric Heating
Barbican Estate - Frobisher	293	Residential Institutions - Gas Heating
BEO Bryer Court	2,856	Residential Institutions - Electric Heating
Upper Thames Street Tunnel Lighting	n/a	Streetlighting
BEO Brandon Mews	2,386	Residential Institutions - Electric Heating
Minorities Car Park	11,668	Car Park
Open Spaces Golders Hill & Extension	2,660	Open Spaces
London Wall Car Park	9,322	Car Park
Open Spaces East Heath & Kenwood	3,882	Open Spaces
Horace Jones House	9,148	Residential Institutions - Electric Heating
Mayor's Court	1,600	Non-residential Institutions – Others
BEO Lauderdale Place (Barbican Estate Office)	1,251	Business

## APPENDIX 6 – Calculation for realisable savings

Energy type	Spend Type	Total energy spend (Nov 19-Oct 20)
<b>Electricity (NHH + HH)</b>	CPG spend (i.e. Guildhall, Police, Barbican)	£3,730,682
	Non-CPG spend (i.e. CCC, Schools, Markets, Housing)	£8,721,094
<b>Gas</b>	CPG spend (i.e. Guildhall, Police, Barbican)	£387,881
	Non-CPG spend (i.e. CCC, Schools, Markets, Housing)	£800,702
<b>CitiGen</b>	CPG spend (i.e. Guildhall, Barbican)	£1,175,377
	Non-CPG spend (i.e. CCC, Schools, Markets, Housing)	£397,264
<b>TOTAL</b>	CPG spend (i.e. Guildhall, Police, Barbican)	£5,293,940
	Non-CPG spend (i.e. CCC, Schools, Markets, Housing)	£9,919,060
	<b>Total</b>	<b>£15,213,000</b>
<b>% split</b>	CPG spend (i.e. Guildhall, Police, Barbican)	<b>35%</b>
	Non-CPG spend (i.e. CCC, Schools, Markets, Housing)	<b>65%</b>
	<b>Total</b>	<b>100%</b>

## APPENDIX 7 – Building Scoring Criteria



20210409\_BuildingScoringCriteria.xlsx