

<p>Committees: Buildings Chief Officer Group – for Decision. CAS Senior Responsible Officer – for Decision. Resource Allocation Sub (Policy and Resources) Committee – for information. Projects and Procurement Sub Committee – for information.</p>	<p>Dates: Jan 2024 Jan 2024 11 March 2024 15 April 2024</p>
<p>Subject: Climate Action Strategy (CAS) – Capital Delivery Programme for Operational Buildings: Parliament Hill Lido PV</p> <p>Unique Project Identifier: 12420</p>	<p>Gateway 3/4/5: Options Appraisal and Authority to Start Work (Regular)</p>
<p>Report of: City Surveyor</p> <p>Report Author: Adam Fjaerem</p>	<p>For Information</p>
<h1>PUBLIC</h1>	

<p>1. Status update</p>	<p>Project Description: This paper is to request funding for the installation of Photovoltaic Panels (PV) on the roof of the Parliament Hill Lido, Hampstead Heath to generate electricity for use within the building. This PV installation is the first of two phases that will work to decarbonise the site and operation.</p> <p>This project was included within the ‘Climate Action Strategy (CAS) – Capital Delivery Programme for Operational Buildings’ which was approved at GW2 and agreed that projects within the programme would be approved through individual gateway 3-5 papers.</p> <p>A smaller PV array was installed in March 2018 however, part of the roof required repairs preventing the installation of PV across the entire roof area. These repairs have now been completed allowing these areas to be utilised for electricity generation.</p> <p>The project is being part funded from the Heritage Building Pathway project to investigate how heritage and/or listed buildings can be decarbonised, and the costs associated with this. This PV installation is an appropriate project to receive this funding as it will show that PV can be retrofitted onto a listed building, but the installation will incur additional enabling costs that would be unlikely/lower cost in a newer or non-listed building.</p> <p>The Lido is an open-air facility which requires the pool filtration pumps to operate 24/7 to keep the swimming water clean and free of detritus. The electricity generated by the new PV during the day</p>
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will help to power these pumps and reduce the sites dependence on grid supplied electricity.

The second planned phase of the project will begin after the installation of the new PV panels and following a review of the combined electrical output over a calendar year. To ensure that all generated electricity is used in decarbonising the building, and not being exported to the grid, the second phase would look to replace the pumps for the pool, paddling pool and fountain with lower energy versions.

Energy saving will be achieved by replacing the pumps but also through better controls that will reduce pump speed and filtration levels during closed periods and quieter months (whilst retaining the required water cleanliness during opening hours).

A final potential project, within this second phase, could use PV generated electricity to heat hot water for the male and female shower blocks utilising the existing calorifiers as thermal stores to reduce the sites gas consumption. This will need further investigation to better understand if the existing calorifiers (installed within the last five years) can have electric immersion heaters retrospectively installed, or whether a thermal store would be required to supply electrically heated water to the existing calorifiers.

Rag Status: Green

Risk Status: This project involves a Medium level of risk as it is dependent upon receiving planning permission (a precedent has already been set with the earlier installation) and a structural engineers refreshed report stating that the roof structure will be able to cope with the additional weight of the PV panels (this was deemed acceptable in 2018 but this assessment requires a refreshed review in line with current guidance).

**Total Estimated Cost of Project (excluding costed risk):
£269,409**

of which £80,000 is being funded by the Design Standard Heritage Building Pathway project (as part of the Climate Action Strategy (CAS), £95,625 is being funded by Cyclical Works Programme (CWP) City Surveyors, Operations Group and the remaining balance of £117,905 (including cost risk) is from the allocated CAS budget.

Change in Total Estimated Cost of Project (excluding costed risk): £160,229 increase on previous estimate due, in part, to the requirement to install a new electrical switch panel, and associated enabling works, at a cost of £95,625

Spend to Date: £0

Costed Risk Provision Utilised: £0 (of which £0 amount has been drawn down since the last report to Committee)

Funding source: Climate Action Strategy (CAS) with contribution from Heritage Building Pathway project and Cyclical Works Programme (CWP) City Surveyors, Operations Group.

Cost explanation: this project should generate 34,300kWh of 'green' electricity per year reducing the reliance on grid supplied electricity and saving 4.7tCO_{2e} per year. The total project comes with a 12.5 year simple payback against the CAS financial contribution.

It should be noted that the PV panels and associated invertors at ~£60k represent 22% of the cost of this project with the enabling works using the majority of the costs. Of these enabling works the requirement for a new electrical switchboard panel at £85k represents the majority of this expenditure.

Design Standard Heritage Building Pathway project

The Design Standard Heritage Building Pathway project is to investigate what can be done with listed buildings to reduce their carbon impact despite their listed status. Installing PV on listed buildings is a good example for this Pathway project as it is likely to show that:

- a retrospective installation of low carbon measures will involve significant enabling works to old and dated infrastructure,
- there will be several different stakeholder's views regarding planning permission,
- the requirement for detailed calculations regarding loading capacities of older structures,
- the impact of time scales when working in buildings frequented by the (paying) members of the public,
- other lessons to be learnt.

As part of the Pathway project a report will be produced that outlines any barriers to installation, any additional costs incurred and any limitations to the installation that came about during the project as a direct result of working on a listed building. This report will be shared as the lessons learnt will be applicable for future installations in other listed buildings across the public sector. Since 2018

	<p>improvements have been made in expected lifetimes, warranties, and electrical output of PV products and this will be reviewed against the earlier installation. At this stage it is thought unlikely that the PV installation on this building will lead to electricity being exported to the grid options will be investigated into methods to prevent this. These are likely to include battery storage, electric vehicle charging points for City of London Corporation vehicles, phase-change material thermal stores etc.</p>
<p>2. Next steps and requested decisions</p>	<p>Next Gateway: Gateway 6: Outcome Report</p> <p>Next Steps:</p> <ul style="list-style-type: none"> • Establish Project Team, to be managed by City Surveyor’s Minor Projects Team, • Instruct works contract for Sykes and Sons Ltd (Sykes), • Sykes to submit planning application and raise supply orders, • Commence installation. <p>Requested Decisions:</p> <ol style="list-style-type: none"> 1. That Option 3 is approved for the delivery of the PV installation works, 2. Note the total estimated cost of the project at £269,409 (excluding costed risk), 3. Approve a budget of £269,409 for the capital works to reach the next Gateway, 4. Approve allocation of £269,409 which is currently available from the Carbon Action Strategy Fund with £80,000 of the budget coming from the Design Standard Heritage Building Pathway project and £95,625 of the budget coming from the CWP. This approval is in accordance with the approved policy approach to deliver reductions in carbon emissions from retrofitting measures in publicly owned operational buildings, 5. Approve a Costed Risk Provision of £24,121 (to be drawn down via delegation to Chief Officer in consultation with the Chamberlain) to be wholly funded from the Climate Action Strategy Year 3 plan for NZ1, 6. Enter into a new works agreement with Sykes to undertake the works as Principal Contractor in accordance with the terms of their Measured Terms Contract with CoL, 7. That Option 3 is approved for the complete installation of the proposed solar PV.
<p>3. Budget</p>	<p>The following sets out the budget for the recommended option 3.</p> <p>Total estimated cost of the project is: £293,530 (including a costed risk budget of £24,121).</p> <p>This is being funded by:</p>

- **£95,625** from Cyclical Work Programme,
- **£80,000** from Heritage Building Pathway project,
- **£117,905** CAS Year 3 Plan.

In accordance with the ‘Climate Action Strategy (CAS) – Capital Delivery Programme for Operational Buildings’ (see background documents) “In the case of centrally funded sites, financial savings that are made will accrue back to the City Corporation as a contribution to the Build Back Better Fund held in City Fund or City’s Estate as appropriate. Therefore, departmental local risk budgets will be adjusted accordingly.”

The funding arrangement is presented in the Options Appraisal Matrix under option 3. The budget requested for option 3 to reach the next gateway is £269,409 and the breakdown is set out below.

Item	Reason	Funds/ Source of Funding	Cost (£)
Works: Switch room panel upgrade.	Main works	Cyclical Works Programme (CWP) City Surveyors, Operations Group.	£85,000
Works: Solar PV supply.	Main works	CAS Year 3 Plan budget. (this paper, GW5 approved budget drawdown)	£57,207
Works: Scaffold, PV installation electrical works, test & commissioning, roofing works, site clearance and hoarding.	Main works		£35,650
Fees: Site supervision/management, RAMs, QHS, O&M, design, structural engineering report, building control, planning permission.	Main works		£61,618
Fees: Consultancy services to support project delivery.	Project delivery resources		£29,934

	<table border="1" data-bbox="485 152 1409 197"> <tr> <td data-bbox="485 152 1251 197">Total</td> <td data-bbox="1251 152 1409 197">269,409</td> </tr> </table> <p data-bbox="485 237 1436 416">Costed Risk Provision requested for this Gateway: £24,121 (as detailed in the Risk Register – Appendix 2) to cover any variations which may be required following detailed design, cost uplift from inflation, additional project management costs and making good, to be funded:</p>	Total	269,409
Total	269,409		
<p data-bbox="161 551 448 618">4. Overview of project options</p>	<p data-bbox="485 533 1409 786">Option 1 (not recommended). Cancel the project. Do not proceed with the project. This is not recommended as it will not support the City of London’s goals for reducing carbon emissions and energy costs nor will it use the Design Standard Heritage Building Pathway funding to provide a benchmark of what Low Carbon measures can be retrofitted onto a listed building and at what additional costs.</p> <p data-bbox="485 826 1430 1227">Option 2: Install the non-certified PV (not recommended). Do not proceed with the project as it does not align with City of London Corporation’s ‘Responsible Procurement Strategy’ as the reputational risk to the City of London of using PV panels associated with modern day slavery is too great. The City of London Corporate PPA solar farm included the following clause in its supply contract <i>‘The Generator shall at all times (i) comply with the Modern Slavery Act 2015 (“Modern Slavery Act”) and (ii) subject to the effectiveness of clause 3.1. ensure its best efforts to make sure its photovoltaic modules supplier comply with SA 8000 or equivalent certification standards”.</i></p> <p data-bbox="485 1267 1430 1335">Option 3 (recommended): Install the Cradle-to-Cradle certified PV. Proceed with the project.</p>		
<p data-bbox="161 1435 448 1503">5. Recommended option</p>	<p data-bbox="485 1417 1401 1451">Option 3, Installation of the Cradle-to-Cradle certified PV panels.</p> <p data-bbox="485 1491 1393 1597">This PV installation will provide self-generated ‘green’ electricity for use by the building as part of its daily electricity consumption reducing the cost of buying electricity from the national grid.</p> <p data-bbox="485 1655 1434 1868">This option provides an estimated saving of c.£9,433 per annum in electricity costs, with a simple payback against CAS financial contribution of 12.5 years (excl. risk). The option provides an estimated annual saving of 4.7 tCO2e, equating to an 8% reduction in the sites carbon emissions and supports the City of London’s energy and carbon reduction goals.</p> <p data-bbox="485 1926 1426 2027">Two future projects could further decarbonise the site by replacing the pool, paddling pool and fountain pumps with lower energy consuming versions that reduce speed during quiet periods to</p>		

	<p>save energy through reduced filtering. A second future improvement could be to use PV generated electricity to heat hot water used in the shower blocks utilising the existing calorifiers as thermal stores and reduce gas consumption.</p> <p>The PV panels in this option are certified from the Cradle to Cradle institute that ensures that the products are independently verified across a number of factors including material use and future recycling, renewable energy used in their manufacture, water conservation during their manufacturing, supply chain verification such as modern day slavery and active social projects.</p> <p>It should be noted that that the Cradle-to-Cradle certified panels generate slightly less electricity per panel (400W rather than 435W or system of 39.2kWp rather than 42.6kWp) than the non-certified panels but come with a 40-year warranty over the non-certified panels 25-year warranty.</p>
<p>6. Risk</p>	<p>Electrical upgrades. The Solar PV installation requires an upgrade of the existing mains electrical panel. It is proposed for these works are procured and delivered by the Sykes as part of their contract.</p> <p>Service interruption. The PV installation works will occur whilst the building is fully operational. Apart from a short period during the final connection to the electrical panel no plant will need to be turned off during the installation and there should be no adverse impacts on the Lido's users. The desire is for the installation works to happen during the colder months of January to March 2024 when usage of the facility is lower.</p> <p>Health and safety: working at height, electrical and other related works will require careful management in line with City of London policies.</p> <p>Further information available in the Risk Register (Appendix 2) and options appraisal matrix.</p> <p>Costs exceed approved budget and costed risk provision. This could be mitigated through a review of the project scope or consideration of either cancellation or approval of additional CAS funding.</p> <p>Costed Risk Provision requested for this Gateway: £24,121 (as detailed in the Risk Register – Appendix 2) to cover any variations which may be required following detailed design, additional project management costs and making good.</p>

7. Procurement approach	<p>The project works set out in this paper are to be carried out through entering into a new works agreement with Sykes through the Measured Terms Contract in place since October 2023.</p> <p>Three quotes for the supply of the PV panels, inverter and fixing mechanism have been sought with the winning quote sent to Sykes to 'top and tail' with their installation costs. Sykes will undertake the design and construction of the works and undertake the duties of Principal Contractor and Principal Designer.</p> <p>Following project completion, the Energy Engineering Project Manager will undertake a basic M&V exercise of comparing the generation meter on the PV inverter against the buildings half hourly electricity consumption over a calendar year before and after the PV installation to evidence the reduction of purchased grid kWh.</p>
8. Design summary	<p>The final design has been provided by the PV supplier (Williams Renewables), Sykes will provide the final electrical design as part of their works agreement and issued to CoL for approval.</p>
9. Delivery team	<p>The project will be led by the Minor Projects Team, City Surveyor's.</p>
10. Success criteria	<ol style="list-style-type: none"> 1. Completed by 25th March 2024. 2. Completed within budget. 3. Energy cost savings of ~£9,450 per annum. 4. Carbon savings of 4.7 tCO_{2e} per annum.
11. Progress reporting	<p>The installation will have a generation meter supplied as part of the inverter system. This can be manually read monthly to check that the PV array is generating electricity to the levels expected for monthly reporting.</p> <p>Annual savings will be calculated based on the reduction of grid supplied electricity consumed by the site per annum as reported via TeamSigma. This reduction in consumption will be calibrated utilising the monthly meter readings from the inverter system.</p>

Appendices

Appendix 1	Project Coversheet
Appendix 2	Risk Register

Background documents

GW2 Paper: Climate Action Strategy (CAS) – Capital Delivery Programme for Operational Buildings

Contact

Report Author	Adam Fjaerem
Email Address	adam.fjaerem@cityoflondon.gov.uk
Telephone Number	07871 107 902

Options Appraisal Matrix

Option Summary	Option 1	Option 2	Option 3
<p>1. Brief description of option</p>	<p>Option 1. Cancel the project. Do not proceed with installing PV panels on the remaining roof space of the Lido.</p>	<p>Option 2. Proceed with non-certified PV installation. This option is to install 42.6kWp PV array onto the roof of the Lido connected via a new electrical panel to distribute the generated electricity throughout the building.</p>	<p>Option 2. Proceed with Cradle-to-Cradle certified PV installation. This option is to install 39.6kWp PV array onto the roof of the Lido connected via a new electrical panel to distribute the generated electricity throughout the building.</p> <p>The PV panels in this option are certified from the Cradle to Cradle institute that ensures that the products are independently verified across a number of factors including material use and future recycling, renewable energy used in their manufacture, water conservation in their manufacturing, supply chain verification such as modern day slavery and active social projects.</p>
<p>2. Scope and exclusions</p>	<p>N/A</p>	<p>Scope:</p> <ul style="list-style-type: none"> • PV panel installation on the roof of the Lido to contribute 	<p>Scope:</p> <ul style="list-style-type: none"> • PV panel installation on the roof of the Lido to contribute

Option Summary	Option 1	Option 2	Option 3
		to the electricity consumption of the building.	to the electricity consumption of the building.
Project Planning			
3. Programme and key dates	N/A	<p>Jan 24: GW3-5 approval,</p> <p>Jan 24: Instruct works agreement with Sykes through the Measured Terms Contract,</p> <p>Jan 24: Contractor mobilisation, planning permission and listed building request submitted, provisional supply orders raised,</p> <p>Feb 24: Commence installation,</p> <p>Mar 24: Complete installation,</p> <p>Mar 25: Gateway 6.</p>	<p>Jan 24: GW3-5 approval,</p> <p>Jan 24: Instruct works agreement with Sykes through the Measured Terms Contract,</p> <p>Jan 24: Contractor mobilisation, planning permission and listed building request submitted, provisional supply orders raised,</p> <p>Feb 24: Commence installation,</p> <p>Mar 24: Complete installation,</p> <p>Mar 25: Gateway 6.</p>
4. Risk implications	N/A	<p>Low</p> <p>There should be no service interruption to the users of the Lido, the installation should take place during January to March 2024 when the use of the facility is at its lowest.</p> <p>Health and safety: working at height, electrical and other</p>	<p>Low</p> <p>There should be no service interruption to the users of the Lido, the installation should take place during January to March 2024 when the use of the facility is at its lowest.</p> <p>Health and safety: working at height, electrical and other</p>

Option Summary	Option 1	Option 2	Option 3
		related works requires careful management in line with City of London policies.	related works requires careful management in line with City of London policies.
5. Stakeholders and consultees	N/A	<p><u>Corporate Property</u> Peter Collinson, Graeme Low, Andrew Coke, Anastasia Batten, Jonathan Cooper, Darren Horrigan, Grayham Howarth, Julie Fittock, Paul Friend, Mark Donaldson, Melodie Peters</p> <p><u>Innovation and growth</u> Kate Neale, Stuart Wright and Michella Dhas</p> <p><u>IT</u> NA</p> <p><u>Chamberlains</u> John James, Andrew Little, Simon Owen, Sarah Baker</p>	<p><u>Corporate Property</u> Peter Collinson, Graeme Low, Andrew Coke, Anastasia Batten, Jonathan Cooper, Darren Horrigan, Grayham Howarth, Julie Fittock, Paul Friend, Mark Donaldson, Melodie Peters</p> <p><u>Innovation and growth</u> Kate Neale, Stuart Wright and Michella Dhas</p> <p><u>IT</u> NA</p> <p><u>Chamberlains</u> John James, Andrew Little, Simon Owen, Sarah Baker</p>

Option Summary	Option 1	Option 2	Option 3
		<p><u>Procurement</u> Jemma Borland</p> <p><u>Communications</u> N/A</p> <p><u>Site users/clients</u> Charlotte Williams, Paul Jeal</p>	<p><u>Procurement</u> Jemma Borland</p> <p><u>Communications</u> N/A</p> <p><u>Site users/clients</u> Charlotte Williams, Paul Jeal</p>
<p>6. Benefits of option</p>	<p>No funding required.</p>	<p>Cost savings est. of c.£10,250/yr. The project savings will be evidenced through the reduction in the metered electricity consumption and cross referenced through the inverter generation meter.</p> <p>Carbon emission savings est. of c.5.1 tCO₂e/yr.</p>	<p>Cost savings est. of c.£9,450/yr. The project savings will be evidenced through the reduction in the metered electricity consumption and cross referenced through the inverter generation meter.</p> <p>Carbon emission savings est. of c.4.7 tCO₂e/yr.</p>
<p>7. Disbenefits of option</p>	<p>Higher ongoing energy and maintenance costs</p>	<p>Capital cost and requirement for a new electrical panel.</p>	<p>Capital cost and requirement for a new electrical panel.</p>

Option Summary	Option 1	Option 2	Option 3
Resource Implications			
8. Total estimated cost	N/A	Total estimated cost (excluding risk): £245,625 . Highly confident in the cost at this stage.	Total estimated cost (excluding risk): £269,408 . Highly confident in the cost at this stage.
9. Funding strategy	N/A	The total estimated cost (including risk) of £272,415 shall be met through the following funding sources: £95,625 from WCP £80,000 from Heritage Building Pathway £70,000 from Climate Action Strategy Fund funding allocated towards making a financial contribution to a project to retrofit Low/Zero Carbon (LZC) Technology to a Listed or Heritage Building in order to produce a case study detailing the complexities of such a project.	The total estimated cost (including risk) of £293,530 shall be met through the following funding sources: £95,625 from WCP £80,000 from Heritage Building Pathway £93,783 from Climate Action Strategy Fund funding allocated towards making a financial contribution to a project to retrofit Low/Zero Carbon (LZC) Technology to a Listed or Heritage Building in order to produce a case study detailing the complexities of such a project.

Option Summary	Option 1	Option 2	Option 3
10. Investment appraisal	N/A.	<p>A simple payback for the whole project has been estimated of 25 years based on estimated cost savings of c.£10,250 /yr. (based on current energy prices).</p> <p>The energy savings are an estimate based on assumptions from the PV design and proposed installation. These estimations will be verified post-completion.</p>	<p>A simple payback for the whole project has been estimated of 28 years based on estimated cost savings of c.£9,450 /yr. (based on current energy prices).</p> <p>The energy savings are an estimate based on assumptions from the PV design and proposed installation. These estimations will be verified post-completion.</p>
11. Estimated capital value/return	N/A	<p>Estimated cost savings of c.£10,250/yr. and simple payback against CAS funding of 9.4 years.</p>	<p>Estimated cost savings of c.£9,450/yr. and simple payback, against CAS financial contribution of 12.5 years.</p>
		<p>Moderately confident (+/-15%). The savings estimate will be refined as the project is developed to final design and verified after completion.</p>	<p>Moderately confident (+/-15%). The savings estimate will be refined as the project is developed to final design and verified after completion.</p>

Option Summary	Option 1	Option 2	Option 3
12. Ongoing revenue implications	N/A	Reducing the amount of electricity needed to be bought from the National Grid.	Reducing the amount of electricity needed to be bought from the National Grid.
13. Affordability	N/A	The cost for this option can be accommodated within funding allocations as set out in item 9 above.	The cost for this option can be accommodated within funding allocations as set out in item 9 above.
14. Legal implications	N/A	None.	None.
15. Corporate property implications	Does not align with the Corporate Property Asset Management Strategy 2020-2025	<ul style="list-style-type: none"> • This project aligns with the Corporate Property Asset Management Strategy 2020-2025 in reducing energy costs and carbon emissions. • Works require careful planning, consultation and coordination to minimise the disruption and impacts to building services and site users. • Security considerations for the contractor to secure the site outside of working hours until all purchased materials installed. 	<ul style="list-style-type: none"> • This project aligns with the Corporate Property Asset Management Strategy 2020-2025 in reducing energy costs and carbon emissions. • Works require careful planning, consultation and coordination to minimise the disruption and impacts to building services and site users. • Security considerations for the contractor to secure the site outside of working hours until all purchased materials installed. • Maintenance contracts and registers need to be updated

Option Summary	Option 1	Option 2	Option 3
		<ul style="list-style-type: none"> • Maintenance contracts and registers need to be updated to account for the new assets. • Commissioning and hand-over process required to ensure the PV is generating as designed. 	<p>to account for the new assets.</p> <ul style="list-style-type: none"> • Commissioning and hand-over process required to ensure the PV is generating as designed.
16. Traffic implications	N/A	None.	None.
17. Sustainability and energy implications	Cancelling the project would be a missed opportunity for reducing energy and carbon emissions for this site and does not support the City of London's net zero carbon targets.	<p>This project supports the City of London's net zero carbon targets as set out in the Climate Action Strategy.</p> <p>This project supports the funding aims of the Heritage Building Pathway project.</p>	<p>This project supports the City of London's net zero carbon targets as set out in the Climate Action Strategy.</p> <p>This project supports the funding aims of the Heritage Building Pathway project.</p>
18. IT implications	N/A	There will be no IT implications for this project.	There will be no IT implications for this project.
19. Equality Impact Assessment	N/A	None.	None.
20. Data Protection Impact Assessment	N/A	N/A	N/A
21. Recommendation	Not recommended	Not recommended	Recommended

