

OUTLINE BUSINESS CASE

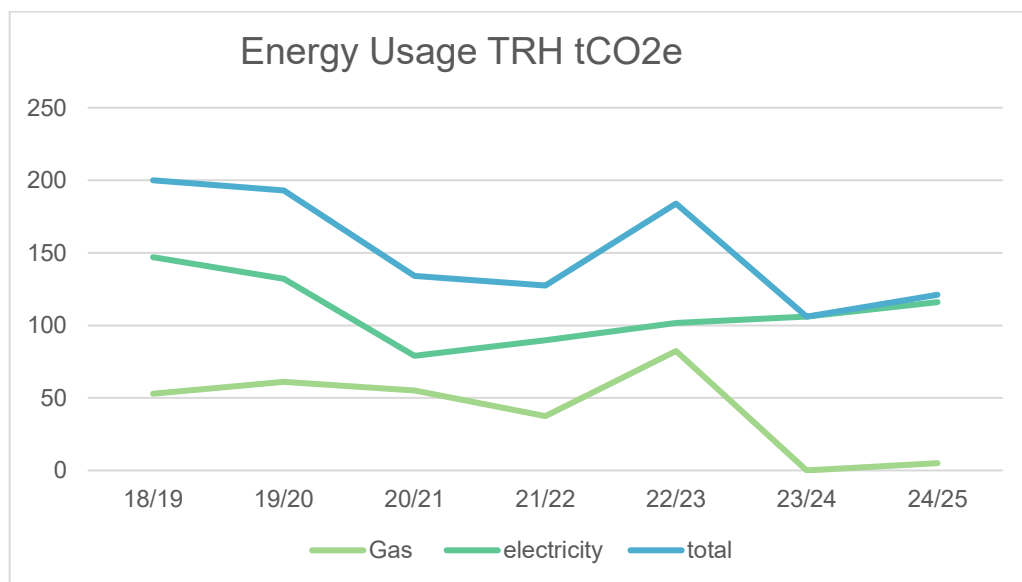
05/06/2025

Installation of additional
rooftop solar PV at Three
Rivers House funded by
council capital budget and
repaid through electricity cost
savings

1. Executive Summary & Recommendations

Provide a summary of key points of the Business Case and recommendations for the governance group to consider.

- 1.1 This Outline Business Case (OBC) recommends that additional rooftop solar photovoltaic (PV) is installed at Three Rivers House (TRH), funded by council capital budget and repaid through electricity cost savings.
- 1.2 A full feasibility study has not been undertaken, as the presence of existing rooftop solar PV at TRH already demonstrates its viability.
- 1.3 The cost of the solar PV system is £50,813 (excluding VAT) which has been identified through a competitive tender process.
- 1.4 The solar PV system is predicted to generate £8,635 of electricity cost savings per year (after allowance for repairs, maintenance and equipment replacement), resulting in a capital payback period of 7.4 years.
- 1.5 The solar PV system is forecasted to save 6 tonnes of CO₂ (tCO₂) per year and 152 tCO₂ over its lifetime. The estimated embodied carbon of the rooftop solar PV is 28 tCO₂ resulting in a payback period of 4.6 years.
- 1.6 The installation of additional solar PV will complement the server room upgrade (2022/23) and Air Source Heat Pump installation (2023/24) which helped reduce the buildings carbon emissions by 63 tonnes (or 34%%) in 2024/25 compared to the pre installation year.
- 1.7 Figure 1 demonstrates the significant reduction in energy consumption since 2018/19, even when considering the impacts of the COVID years. The PV extension will support the cost of the running the ASHP.



Tonnes CO2e	18/19	19/20	20/21	21/22	22/23	23/24	24/25
Gas	53	61	55	38	82	0	5
electricity	147	132	79	90	102	106	116
total	200	193	134	127	184	106	121

Figure 1 Three Rivers House Gas and Electricity use

- 1.8 We acknowledge that local government reform introduces uncertainty around the future ownership of Three Rivers House. However, with a payback period of 7.4 years, combined with the added benefits of improving the building's saleability and rentability, we suggest installation of additional solar PV is still a sensible investment.

2. Objectives

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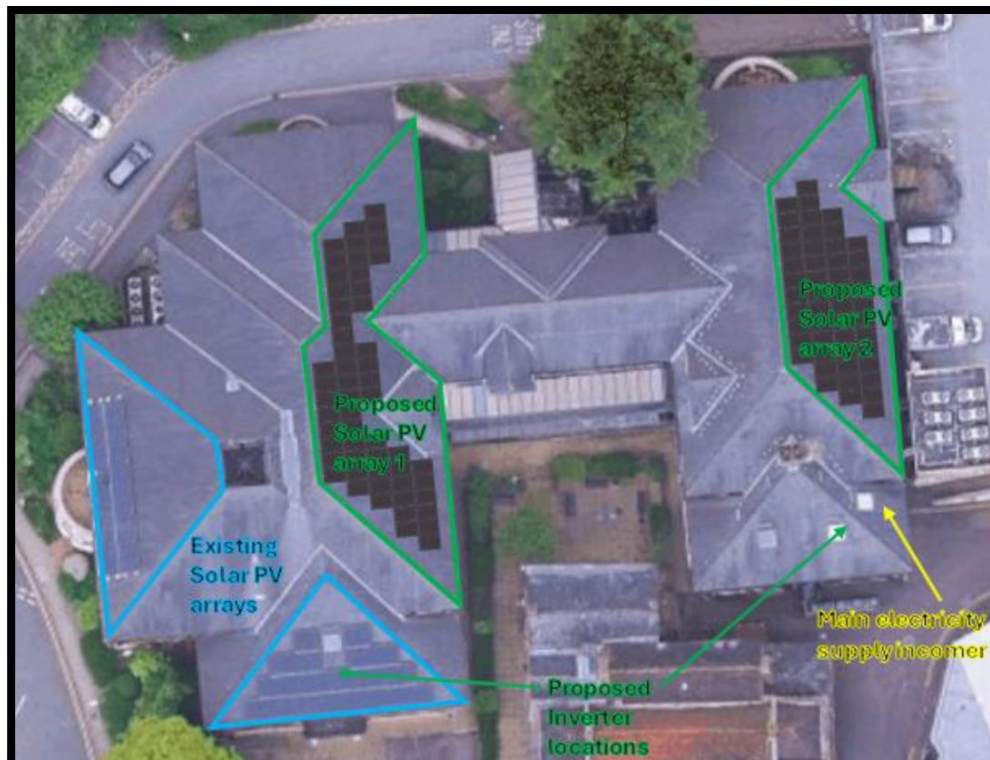
- 2.1 The objective of this project is to contribute to the council having a net zero building estate and to meet its ambitions, as set out in the approved Climate Change and Sustainability Strategy, where the council committed to achieving net zero by 2030 for our own emissions. An important element of the council's ambition to achieve net zero is the decarbonisation of council buildings. The installation of additional rooftop solar PV at Three River House will support the council's corporate plan objective to achieve carbon net zero.
- 2.2 A second objective is to reduce the running costs of the electrical requirement of Three Rivers House.

3. Background and context

- 3.1 In 2018, a 17.5 kw solar PV system was installed at TRH consisting of 65 x Seraphim All Black 265w panels connected to a Fronius Symo-7.0 7kw Invertor and a Fronius Symo-10.0 10kw invertor. The solar PV system generates ~10MWh per year.
- 3.2 In 2022, the Association for Public Service Excellence (APSE) completed energy surveys of the council's core buildings. The APSE surveys identified a range of potential projects that could reduce the carbon emissions of the buildings. APSE recommended the installation of additional rooftop solar PV at TRH.
- 3.3 In 2023, a structural roof survey was completed which raised no significant concerns about the installation of additional rooftop solar PV at TRH.
- 3.4 In February 2025, the council allocated £500k of additional capital funding per year (for financial years 2025/26, 26/27, and 27/28) for decarbonisation projects to help the council to achieve its net zero target.¹
- 3.5 In May 2025 a competitive tender process was completed, , to identify the optimum solar PV design and installer to a maximum budget of £50,000.
- 3.6 The council received ten tender proposals which were scored on quality (60%) and price (40%). The highest scoring proposal was submitted by Chiltern Solar.
- 3.7 Chiltern Solar is a Microgeneration Certification Scheme (MCS) accredited solar PV installer established in 2011 and based in Chesham, Buckinghamshire. Chiltern Solar installed the existing solar PV system at TRH in 2018 utilising Fronius Symo invertors.

¹ <https://moderngov.threerivers.gov.uk/documents/g1461/Agenda%20frontsheet%2025th-Feb-2025%2019.30%20Full%20Council.pdf?T=0>

- 3.8 Chiltern Solar have proposed a 47.70 kWp comprising of 106 450w PV panels.² The PV panels will be connected to 2 Fronius Symo invertors which will convert Direct Current (DC) electricity in mains electricity (AC).
- 3.9 Using 2 additional Fronius Symo invertors enables the solar generation of both the existing and new PV systems to be monitored through one online monitoring tool. This is an advantage as it will enable solar PV performance reporting at TRH to be undertaken through one monitoring tool, rather than two (i.e. having separate monitoring tools for the existing and new PV systems).
- 3.10 Figures 2 and 3 identifies the roof area where the proposed solar PV system will be installed.



Blue Box = Existing solar PV
Green Box = Proposed roof area for new solar PV
Green Arrow = Proposed inverter locations for new solar PV
Yellow Arrow = Main electricity meter location

Figure 2 Proposed Solar PV Locations (Aerial Photograph)

² kWp stands for kilowatt-peak, and it refers to the maximum output of a solar power system under ideal conditions. 450w means a PV panel can generate 450 watts of electricity when exposed to full sunlight.

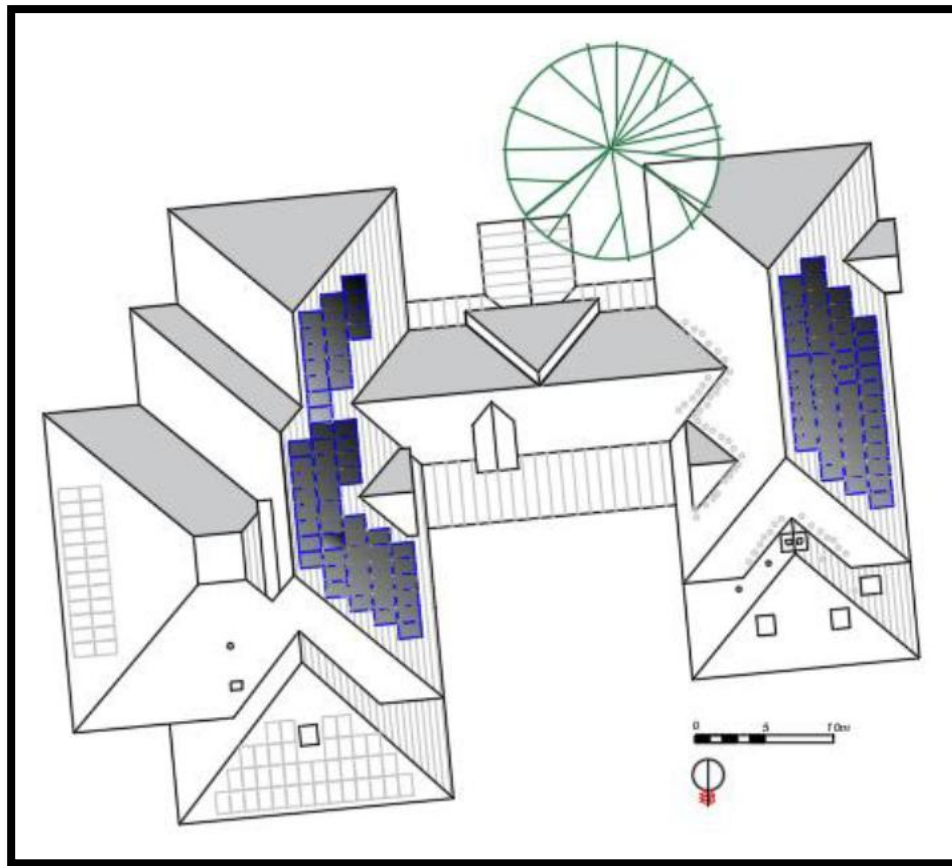


Figure 3 Proposed Solar PV Locations (Plan)

- 3.11 The solar PV panels will be mounted to the roof using the Fastensol pitched roof mounting system. The mounting system will be black, as will the PV panels, so the new PV system matches the existing system. A product called Solar Flash will be used to help ensure the installation of the mounting brackets does not cause water ingress in the building.
- 3.12 Chiltern Solar predict that the solar PV system will take 10 working days on-site to install the solar PV system which will require scaffolding.
- 3.13 Chiltern Solar propose scaffolding with a working platform along the two main east floor roof gutter lines, along with edge protection (with meshing and toe boards) up each roof. A hoist will be used, guided by two banksmen, to lift the PV panels onto the roof. The exact location of the scaffolding and the secure storage compound is to be agreed with the Property & Major Projects Team.
- 3.14 The warranties are 25 years for the solar panels, 10 years for the inverters and 2 years for installation and workmanship.
- 3.15 Building tenants will be informed of the works before work starts on-site. A one-hour power shutdown will be required for the final system connection. The power shutdown will be undertaken in partnership with Projects & Facilities Manager to ensure a safe shutdown and minimal disruption to tenants.
- 3.16 Development Management have advised planning permission is not required and the work therefore falls within permitted development rights. A prior approval application will need to be submitted.

- 3.17 The solar PV system is predicted to generate 35,646 kWh of solar electricity and save 6 tCO₂ and ~£8,635 per year, and capital payback period of 7.4 years.
- 3.18 The quoted cost of the solar PV system is £48,038 (excluding VAT). Please note that this cost does not include several items the council may want to consider, at an additional cost:
- Structural Survey: Chiltern Solar did not specify a structural survey because one was carried out in 2023. However, that structural survey was not based on a specific solar PV design. Now we have the proposed design (roof location, number of panels, layout etc) another, more specific structural survey could be completed. The estimated cost of the survey is £1,075 (exc VAT).
 - Bird Blocker: A bird blocker is a mesh that stops birds nesting under the PV panels. The estimated cost is £1,700 (exc VAT).
 - Building Consumption Monitoring: Additional functionality that enables the electricity consumption of the building from the grid, and solar electricity export to the grid, to be monitored through the same online tool as solar PV generation. This enables more detailed performance reporting (e.g. peak electricity demand periods vs peak solar generation periods). The estimated cost is £1,000 (exc VAT).
 - Annual Maintenance & Repair Contract: A contract with the solar PV installer to visit TRH on an annual basis to clean, test, maintain and repair the solar PV system. The estimated cost is unknown.
- 3.19 It is recommended that a structural survey and bird blocker are added to the project as it helps reduce the risk of significant structural and operational issues in the future.
- 3.20 The new solar PV array is forecasted to generate 8% of TRH's electricity needs and therefore export minimal electricity to the grid. Therefore, it is suggested Building Consumption Monitoring is not needed and can be easily added later if required.
- 3.21 While regular maintenance and repair is best practice to maintain the efficiency of the solar PV system, access to the roof at TRH is challenging and would require costly scaffolding to undertake the works. Therefore, it is suggested that an Annual Maintenance & Repair Contract is not included, but like the existing system repairs, maintenance and equipment replacement are done on an ad hoc basis. A provision of £1000 per annum has been made in the business case.
- 3.22 Appendix 4 details the Sustainability Funds Financial Appraisal and is summarised in Table 1 based on the tendered cost of £50,813:

Table 1 Sustainability Funds Financial Appraisal

Capital Cost (inc structural survey & bird blocker)	£50,813
Forecasted Annual Electricity Saving (after allowance for repairs/maintenance/equipment replacement)	£8,635
Capital Payback Period (in years)	7.4
Net Present Value (25 years at 3.5% discount rate)	£88410.5

- 3.23 Installing rooftop solar PV at TRH will contribute to 3 key themes in the Corporate Framework 2023-2026:

- 3.24 “Net Carbon Zero & Climate Resilient”: The rooftop solar PV will remove 6 tCO₂ annually and 152 tCO₂ over its lifetime. The council class carbon emissions from TRH as Scope 1 (direct) emissions. Therefore, reducing TRH’s carbon emissions will support the council’s commitment to be net zero by 2030. The programme to decarbonise council buildings is set out in the Climate Emergency and Sustainability Strategy (2023-2027).
- 3.25 “Provide responsive and responsible local leadership”: By installing additional rooftop solar PV on our headquarters, we will show residents and businesses that we are leading by example and will encourage others to follow.
- 3.26 “Support and enable sustainable communities”: The rooftop solar PV will help improve both the environmental and financial sustainability of TRH. TRH is an important community building which rooftop solar PV will help make cleaner, greener and more resilient.

What other programmes, projects or services does it link to?

- Property and Major Projects

4. Options

	Option 1 – Do Nothing	Option 2 – Recommended	Option 3 – Wait for grant funding
Description of the Option <i>A brief description including what is in and out of scope</i>	Do not install additional solar PV at TRH.	Rooftop solar PV is installed at TRH funded by council capital budget and repaid through electricity cost savings	Wait for grant funding to become available to fund the additional solar PV at TRH negating the need for the council to fund the solar PV.
Timing <i>Approximate start, end and delivery dates</i> <i>Include key milestones</i>	N/A	Corporate Management Team – 24 th June Joint Leadership Team – 8 th July Policy & Resources Committee – 8 th September Project Start – Q4 2025	Timing unknown. At the time of writing no grant funding is available. The primary source of funding for solar PV to public buildings (excluding schools and hospitals) is the Public Sector Decarbonisation Scheme. However, the PSDS focuses on heat decarbonisation. So, while the PSDS will provide grant funding for solar PV, it must be installed in conjunction with a heat pump. TRH already has a heat pump (part funded by the PSDS) and so will not be eligible for PSDS funding in the future. Please note that grant funding is often awarded through a competitive process, so even if eligible grant funding becomes available, there is no guarantee the council will be successful in its grant application.
Costs and resources Include capital and revenue costs Include staffing requirements	£0	£48,038 quoted cost for solar PV system £1,075 estimated cost for structural survey £1,700 estimated cost for bird blocker	£0
Cashable Benefits <i>High level benefits that will deliver savings against a specific budget code</i>	N/A	£8,635 - forecasted annual electricity savings, after allowance for £1000/ annum for ad hoc repairs, maintenance and equipment replacement	None – until grant funding becomes available.

Non-Cashable Benefits <i>Benefits such as efficiency savings and increased customer satisfaction</i>	None	6 Scope 1 tCO ₂ emissions saved per year. 152 lifetime Scope 1 tCO ₂ emissions savings. Demonstrates best practice.	None – until grant funding becomes available.
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<p>Risks and Opportunities <i>High level risks and opportunities associated with the option</i></p>	<p>Risks: Strategic Risk 10 – Failure to deliver net-zero carbon commitments - Impacts negatively on the council's ability to achieve net zero by 2030.</p> <p>Opportunities: None</p>	<p>Risks: There is an inherent risk with solar PV of damaging the roof either during installation or afterwards because of the additional weight. This risk will be mitigated by carefully reviewing (with help from the Property Team) the panel mounting system and installation method the solar PV design recommends. Additionally, we will commission another structural roof survey, based on the proposed PV design, before installation to confirm the roof can support the weight.</p> <p>The solar PV could generate less electricity than forecast which would reduce the electricity cost savings to the council and lengthen the payback period. Alternatively, the solar PV could overperform forecast and generate more benefits than estimated in this OBC.</p> <p>Opportunities: The opportunity is for the council to install solar PV on one of the council's biggest electricity consuming buildings.</p>	<p>Risks: No grant funding becomes available for which the project is eligible, or the council is not successful in its grant application resulting in:</p> <p>Strategic Risk 10 – Failure to deliver net-zero carbon commitments - Impacts negatively on the council's ability to achieve net zero by 2030.</p> <p>Opportunities: In December 2024 the UK Government published the Clean Power 2030 Action Plan. The mass deployment of solar PV is a key strategic action. While the Action Plan doesn't promise new, or more, solar PV grants, it is reasonable to assume that solar PV grants will be available in the future.</p>
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1. Engagement with support services

- 1.1 The Property & Major Projects, Climate Change & Sustainability, Procurement teams, and Director of Finance collaborated to undertake the solar PV tender and create this OBC.

2. Data Protection

- 2.1 A Data Privacy Impact Assessment is not required.

3. Equalities Impact

- 3.1 A Short Equality Impact and Outcome Assessment has been completed. There are no negative impacts identified as arising from the project.

4. Sustainability Impact

- 4.1 The Climate and Sustainability Impact Assessment has been completed as per the table below.
- 4.2 The project scores highly in the homes, buildings, infrastructure, equipment and energy section as it will improve energy efficiency and reduce grid electricity use.
- 4.3 The project scores highly in the goods and consumption section because solar PV panels can be recycled.
- 4.4 The project scores highly in the engagement & influence section as installing solar PV on a community building and point of local interest will demonstrate best practice.
- 4.5 All other sections are not applicable due to limited nature of the project.

Climate and Sustainability Impact Assessment Summary	
Homes, buildings, infrastructure, equipment and energy	3.40
Travel	N/A
Goods and Consumption	3.00
Ecology	N/A
Adaptation	N/A
Engagement and Influence	3.00
Total Overall Average Score	3.13

5. Decision making and governance

5.1 This OBC has been reviewed by the Head of Property & Major Projects, Associate Director for Environment and Director of Finance.

5.2 And will be considered by:

- Joint Leadership Team on 19/08/25
- Policy and Resources Committee on 08/09/25.

- The Climate Change & Sustainability Team will produce quarterly and annual reports to track solar PV key performance indicators.

6. Next steps

- Instruct officers to install a 47.7kwp Solar PV array on the roof of Three Rivers House, appointing Chiltern Solar as the installer.

Meeting where <i>authority to proceed</i> was obtained	Date of meeting
JLT	19/08/25

