

Solar PV feasibility – stage 2

Units 1A & 1B, Mendalgief Retail Park, Newport NP20 2NW



Prepared for: Columbia Threadneedle Investments

Prepared by: Ismail Ragab

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Hollis, Compass House, Rose Wharf, East Street, Leeds LS9 8EE
T +44 113 259 5930 hollisglobal.com

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Registered office: 138 Cheapside, London, EC2V 6BJ.
VAT number 863 8914 80. Regulated by RICS.

Contents

1.	Executive Summary	4
2.	Introduction	5
3.	Consumption analysis	6
3.2.	Limitations of scope	7
4.	Roof and access	8
5.	PV system sizing	11
5.2.	PV System Sizing Options	11
5.3.	Solar PV System 3D model	12
6.	Shading analysis	14
7.	Payback calculations	15
8.	Financial Analysis.	16
9.	Conclusions and recommendations	18
10.	Planning	19
11.	Distribution Network Operator (DNO)	20
12.	EPC	21
13.	Smart export guarantee (SEG)	22
13.2.	Next steps	22
14.	Disclaimer	23
15.	Project key risks	24

Appendices

Appendix A Projected revenue investment proposal Rentalise Landlord Pack

Appendix B Projected revenue investment proposal Rentalise Tenant Pack

Appendix C Projected revenue investment proposal PPA Landlord Pack

Appendix D Projected revenue investment proposal PPA Tenant Pack

Version control

Version	Author name	Issue Date	Approval name	Issue Date
1.0	Ismail Ragab	29/09/2025	Tankut Panayir	30/09/2025

1. Executive Summary

- 1.1.1. The site presents a good business case for the adoption of solar PV to reduce the site's energy and carbon demand, helping with an enhanced EPC classification, which will assist with forthcoming changes to MEES, gain Net Zero Carbon accreditation and make the building more desirable from a rental perspective.
- 1.1.2. This report evaluates the performance of three solar photovoltaic (PV) installations—Rooftop —analysing their energy generation, efficiency, and impact on-site consumption.
- 1.1.3. Key PV system facts (including access provisions):
 - The solar PV system comprises Rooftop (64.80 kWp).
 - The total solar generation from the systems is 60,510 kWh/year.
 - The System maximises CO₂ reduction, preventing 8.2 tonnes of CO₂ emissions annually.
- 1.1.4. The financial analysis indicates that the rentalised model is the more advantageous option for implementing a solar PV system compared to the Power Purchase Agreement (PPA) model. The rentalised option offers a shorter forecasted return on investment (10 years versus 15 years) and a significantly higher Internal Rate of Return over 25 years (5.34% compared to -1.36%). It also delivers a greater forecasted cash flow (£174,416 versus £169,205).
- 1.1.5. The units are being combined into a single supply under MPAN 2100040807887 (Unit 1A), with an expected capacity of approximately 150 kVA.
- 1.1.6. Thought should be given in the design and project implementation, especially in areas of the roof where safe access (mansafe, etc) is not currently installed. This should be considered to ensure easy ongoing maintenance of the system. Within the safe system of work and design risk assessments, the contractor should also detail the ongoing maintenance strategy of the panels for replacement and cleaning, including how the roof will be accessed once the temporary scaffolding has been removed.
- 1.1.7. In summary, the installation of PV is recommended in delivering a more sustainable building, reducing tenants' bills and assisting with changing legislative requirements.
- 1.1.8. Hollis can assist further through a structured approach in delivering a successful project from the initial client brief and specification development through to competitive tendering and analysis, contract negotiation and overseeing project delivery and handover.

2. Introduction

- 2.1.1. Columbia Threadneedle Investments, referred to herein as the “client”, has instructed Hollis to undertake a high-level stage-2 solar PV feasibility report for the roofspace at Units 1A and 1B, Mendalgief Retail Park, Newport, NP20 2NW.
- 2.1.2. The purpose of this feasibility assessment was to establish the building identified above for solar photovoltaic (PV) suitability. The stage 2 report looks from a top-level perspective, utilising independent desktop modelling software and satellite imagery to assess a conceptual design, evaluate risks and opportunities, and understand the merits of further developing the solar project.

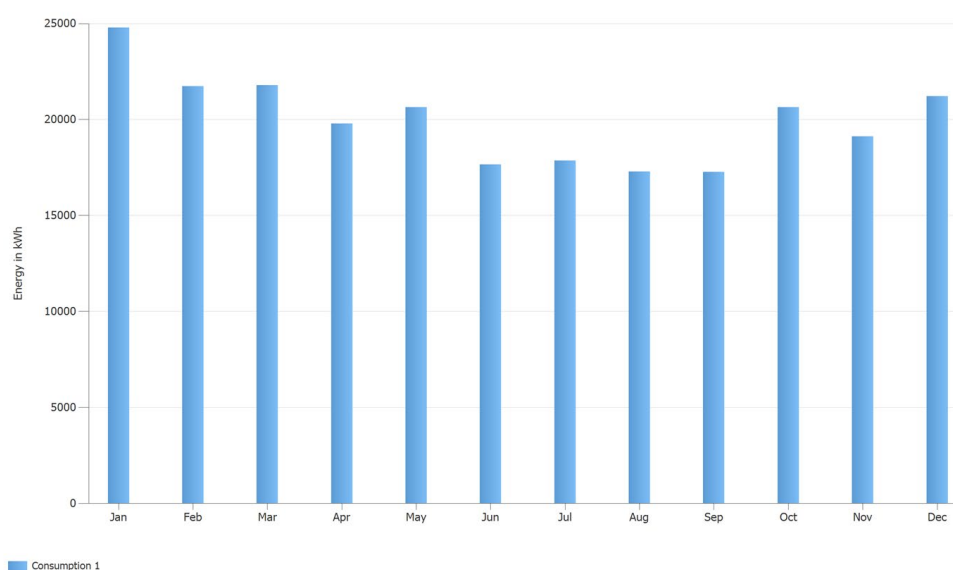


Credit: Image supplied courtesy of Google® (the concerned development is marked within a red boundary).

3. Consumption analysis

- 3.1.1. In lieu of half-hourly data, the energy consumption for all units has been calculated using the CIBSE Energy Benchmark (TM46: 2008), based on the usage class from the most recent EPC certificate 70 kWh/m²/year.
- 3.1.2. The PV system will be connected to the main distribution board, allowing the building to benefit from the renewable energy generated.
- 3.1.3. The units are being combined into a single supply under MPAN 2100040807887 (Unit 1A), with an expected capacity of approximately 150 kVA.
- 3.1.4. The following details for the whole building space are as follows:

Expected usage	A1/A2 Retail and Financial/Professional services
Total floor area ▪ From Drawings	3,425 m ²
Expected energy use CIBSE Energy Benchmark (TM46: 2008)	239,750 kWh/PA
The energy efficiency rating for this property EPC rating	59 C
MPAN (Meter Point Administration Number)	2100040807887



The Annual electricity consumption profile is based on the BDEW commercial load profile (G1).

3.2. Limitations of scope

- 3.2.1. Specialist PV design software was used to model the property and the solar PV array on the building to forecast yields and system performance (PVSOL Premium 2025 (R10)).
- 3.2.2. Satellite imagery has been used in the modelling and PV calculations of the unit for feasibility purposes.
- 3.2.3. It is assumed that the DNO will allow for 100% of PV production to be utilised and/or exported back to the grid; this will be confirmed with the DNO during the G99 application and offer process.

4. Roof and access

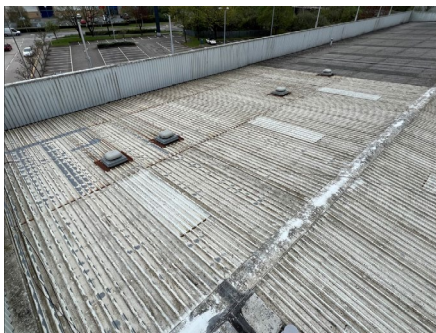
- 4.1.1. The buildings are fitted with a metal profile trapezoidal roof at an approximate pitch of 6°. The roof contains oversheeted skylights, which will remain as metal sheet infills, along with service vents. These features have been fully incorporated into the photovoltaic (PV) model to determine the usable roof area available for panel installation.
- 4.1.2. The existing roof construction is currently unknown. A full review shall be carried out to confirm the complete roof build-up, including the roof sheets, insulation, and coating. The flammability of each element must be assessed to ensure compliance and to obtain insurance approval.
- 4.1.3. Currently, there appears to be no mansafe system in place . It is recommended that a mansafe system be installed to ensure safety during future roof and solar PV maintenance work.
- 4.1.4. A comprehensive roof survey should assess roof condition, addressing issues such as leaks, bird fouling, and nesting, while determining if the roof's remaining lifespan is at least 20–25 years. Ensuring this longevity is critical to prevent the need for PV system removal and reinstallation during future roof refurbishment.
- 4.1.5. A structural engineer will need to review the panel's weight and positions and associated fixing methodology to ensure that the roof's structural integrity is not compromised. The study should consider factors such as wind uplift, deflection, and point loadings, but not limited to them.
- 4.1.6. The mounting system selected should be from a recognised approved solar manufacturer that is MCS certified, using a solar rail with rubber EPDM pre-glued gaskets to counteract wind uplift forces, seismic forces, and other environmental factors that could affect the stability of solar panels. The clamps should all be from the same manufacturer. Any roof warranties and caveats should be checked before the installation to ensure the installation does not invalidate them or whether there are incompatibilities.
- 4.1.7. There appears to be no permanent access to the roof. For ongoing maintenance, it is advisable to install a permanent external roof access point on each block leading to the main PV roof. The roof access point should allow for safe connection to the mansafe system. A specialist advisor should be consulted for the design and risk assessment of the access system.
- 4.1.8. To mitigate point load concerns, the solar mounting equipment and panels should be lifted onto a loading platform via a telehandler and moved to the scaffolding area. This method will reduce direct load pressures on the roof during installation.
- 4.1.9. The insurance provider of the building should be contacted to confirm what requirements they have for the PV installation. In addition, the original installer/manufacturer should be contacted, if possible, to confirm the exact roof insulation and material layout of the roof and to understand if the PV installation will have an impact on the roof's warranty.

- 4.1.10. Details of the exact roof insulation and material layout for the roofs were not available in the O&M manuals during the site survey.
- 4.1.11. To meet RICS and insurance requirements, PV installations should only be installed on non-combustible roofs that achieve Class A1/A2, in accordance with BS EN 13501-1 standards. Roofs that are combustible pose a heightened risk, as fire can spread rapidly, minimising the effectiveness of any protective measures within the building.
- 4.1.12. Following a safety review, it would be recommended to install skylight protection to prevent accidents during installation and maintenance. The protection should be carefully designed to ensure the safety of personnel working on the roof and prevent any accidental damage to the skylights.

Roof access examples. (internal and external)



Roof overview





5. PV system sizing

- 5.1.1. The solar PV feasibility report considered increased self-consumption greater than 80%. makes the system more financially viable by improving the budget forecast and shortening the payback period.

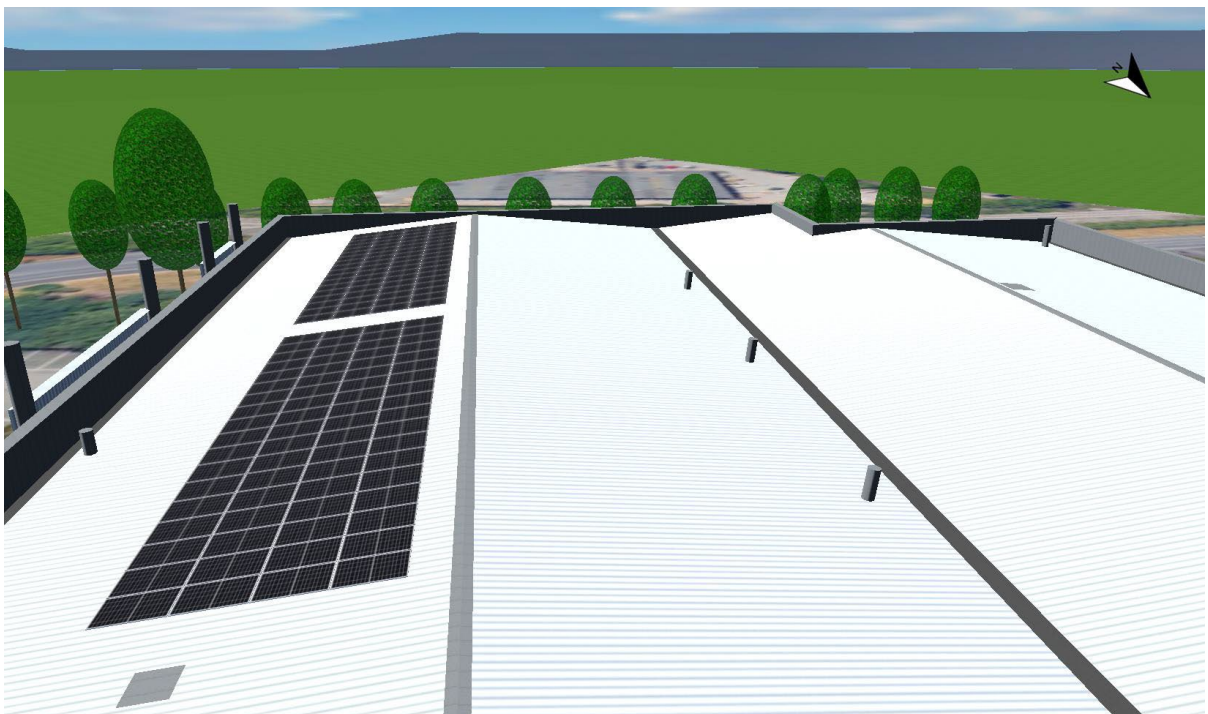
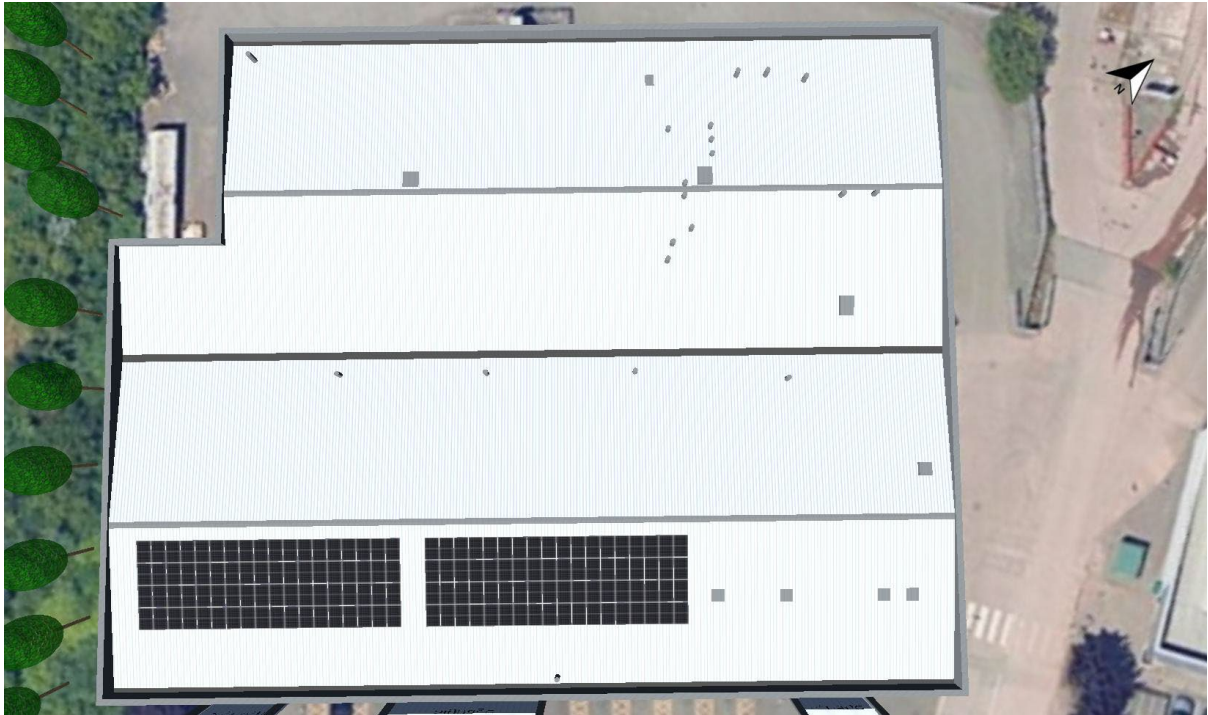
5.2. PV System Sizing Options

Description	Rooftop
Panel pitch	6° (for pitched roof)
Azimuth	Southeast 130 °
System size (kWp)	64.80
System annual yield (kWh/kWp)	933.25
Performance Ratio (PR)	85.35 %
Shading (% loss)	2.8%
PV system yield (kWh/year)	60,510
PV consumed on site (kWh/year)	49,034
Forecast percentage of PV consumed on-site	81.0 %
Annual Consumption (kWh/year)	239,750
Consumption covered by PV (kWh/year)	49,034
Consumption covered by grid (kWh/year)	190,751
Solar Fraction	20.4 %
CO2 avoided (tonnes/per annum)	8.2
Grid Export (kWh/Year)	11,476

- *All results and performance metrics in this report are derived from P50 projections, representing the median energy production estimate with a 50% probability of being met or exceeded. These projections are based on statistical analysis of uncertainties, including weather patterns, equipment performance, electricity consumption and other operational factors, providing a realistic and balanced forecast of system output.*

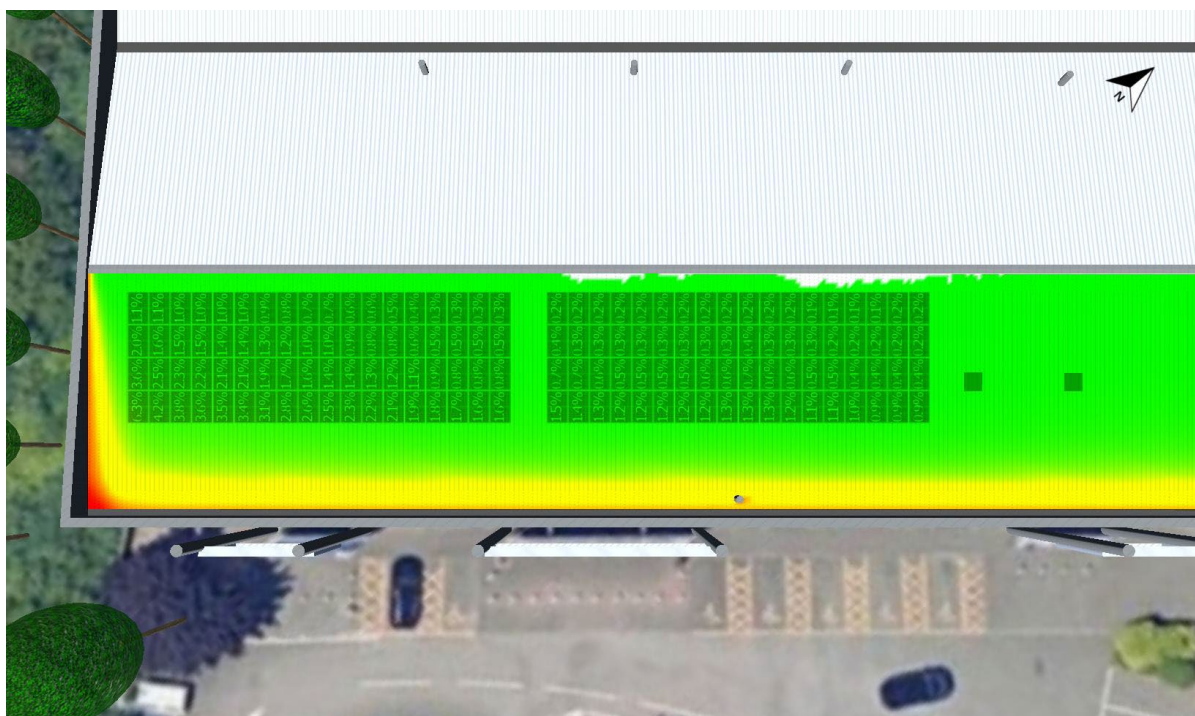
5.3. Solar PV System 3D model





6. Shading analysis

- 6.1.1. From the outputs of the 3D models, the calculated annual losses from simulated shading from nearby obstacles to the solar panels are estimated to be 2.8%; this is considered an acceptable shading level.
- 6.1.2. The images below highlight the shading losses on each panel over 365 days.



7. Payback calculations

7.1.1. For the purposes of this report the following key variables have been incorporated within the modelling software:

Variable	Detail
Government average electricity rate for similar energy users (including CCL charges)	£29.29 p/kWh
Forecast interest rate on electricity charges	3%
Solar panel degradation over 25 years	0.6 %/year
Smart Export Guarantee (SEG) tariff	£0.06 p/kWh
Forecast interest rate on SEG	3%
Maintenance factor (% per annum)	3%
Forecast interest rate on maintenance	3%
System losses (soiling losses, system unavailability)	8%
Cable losses	0.5%
CO ₂ saving (kg p/kWh) – SAP10	0.136
Roof pitch	6°
Panel pitch	6°
Weather station data Newport (2001–2020, Meteonorm 8.2(i))	1077 kWh/m ²
Annual Average Temperature	11.0 °C

7.1.2. No additional costs have been allowed for building fabric improvements to facilitate the PV system, such as, but not limited to, roof works, additional access, electrical infrastructure of the building supply, and structural reinforcement works.

8. Financial Analysis.

- 8.1.1. The financial analysis evaluates two business models for implementing solar PV systems. The first option involves leasing the PV system to the tenant, with an agreed-upon rental uplift in exchange for the benefits of the generated energy. The second option proposes charging the tenant for on-site solar energy consumption under a Power Purchase Agreement (PPA).

Aspect	Rentalising the system	Power Purchase Agreement (PPA)
Explanation	The landlord adds a rental uplift for the use of solar power.	The landlord or third-party provider installs, maintains, and charges for solar power based on consumption.
Revenue Model	-Fixed rental uplift added to the tenant's rent. -Predictable revenue.	-Pay-as-you-use model, charged per kWh consumed. -Revenue depends on tenant usage.
Billing/ Monitoring	No separate billing or monitoring is needed.	-Requires consumption monitoring and billing for energy used. -Extra cost for metering installation. -May require third-party involvement. For invoicing
Maintenance and management	-The landlord retains full control over the asset. System maintenance is the tenant's responsibility.	The landlord or third party controls the maintenance.
Tenant Impact	No direct link between energy use and cost; flat rent increases. Less tenant savings.	Tenants pay for energy consumed, incentivising energy efficiency. Higher tenant savings
Exported energy revenue (SEG)	The tenant will claim the SEG	The landlord will claim the SEG

- 8.1.2. For landlords considering the installation of a solar photovoltaic (PV) system with a capacity of less than 100 kWp per unit, a highly effective option is to rentalise the asset. Under this arrangement, the landlord and the tenant agree upon a rental uplift for the use of solar PV energy. This allows the tenant to utilise the solar power without the need for detailed monitoring of consumption, export, or managing billing. The tenant will benefit from any export contract they wish to set up.
- 8.1.3. The energy rate at £0.2929 per kWh as per the energy prices from the Department for Energy Security and Net Zero.
- 8.1.4. Based on the recent PPA market price, the PPA rate is £0.20 per kWh.

8.1.5. The table below summarises the financial outcomes of both options, with detailed calculations provided in Appendix A: Projected Revenue Investment Proposal.

Parameter	Rentalising	PPA
Forecast budget system costs (£) *	£89,863	£91,313
Forecast return on investment (ROI) (years)	10	15
Forecast Internal Rate of Return (IRR) (25 years)	5.34%	-1.36%
Forecast cash flow (25 years)	£174,416	£169,205
Net Present Value (NPV)	£84,553	£77,892
Lifetime cost of energy for PV system (CAPEX/total generation) (£p/kWh)	0.1695	0.1910
Increased Rental Value	£13,643.96	£0

- All costs exclude associated roofing works, access, edge protection & Skylight covers and structural works (if needed) and are provisional sums subject to a full tendering exercise for all units to confirm figures. Witness test fees will be confirmed (if any) once the DNO approval is received.

8.1.6. Based on the financial analysis, the rentalised system emerges as the more viable option for implementing solar PV systems. It offers a significantly shorter forecasted return on investment (10 years compared to 15 years under the PPA model) and a higher Internal Rate of Return (IRR) over 25 years (5.34% versus -1.63%). Furthermore, the forecasted cash flow for the rentalised option over 25 years is £174,416, which is notably higher than the £169,205 generated under the PPA model.

8.1.7. The forecast budget system cost for the PPA model is likely to be higher due to the need for additional export meters, management fees and legal fees.

8.1.8. The rentalised model also improves the property's annual rental value by £13,643.96, while the PPA model does not contribute to rental value. Additionally, the lifetime cost of energy for the PV system is lower under the rentalised option (£0.1695 per kWh versus £0.1910 per kWh). These factors collectively make the rentalised system the most financially beneficial option for both the landlord and the tenant.

8.1.9. In the rentalised model, the tenant would benefit from the export tariff (payment for excess solar energy exported to the grid under the SEG scheme), while the landlord would bill the tenant for 100% of the PV generation.

8.1.10. PV helps with the overall carbon reduction strategy through energy reduction, reducing carbon, and making the building more attractive to the rental market. The PV system is expected to cover 20.0% of the annual electricity consumption.

9. Conclusions and recommendations

- 9.1.1. With a system size of 64.80 kWp, the solar array has a substantial capacity to generate clean energy. The system's annual specific yield of 933.25 kWh/kWp indicates good efficiency, producing nearly 933.25 kilowatt-hours for every kilowatt installed. Its performance ratio (PR) of 85.35% demonstrates that most of the sunlight captured is effectively converted into electricity.
- 9.1.2. The PV array comprises 144 No. Solar PV modules covering 287.7m² of cumulative PV area on the roof in the direct plane(s) of the roof.
- 9.1.3. The facility's expected annual energy consumption is 239,750kWh, of which 190,751 kWh is supplied by the grid, with the rest covered by solar. This means the solar fraction, or the proportion of energy demand met by solar, is 20.0%, demonstrating a meaningful contribution toward sustainable energy goals.
- 9.1.4. The system prevents approximately 8.2 tonnes of CO₂ emissions annually, highlighting its positive environmental impact on the Energy Performance Certificate (EPC) rating of the building, which can help with Minimum Energy Efficiency Standard (MEES) ratings when combined with other energy-saving systems.
- 9.1.5. The impact of shading is medium, with only 2.8% of potential energy lost annually. This results in a total PV system yield of 60,510 kWh/year, providing significant energy production for on-site use. Out of this, 49,034 kWh/year is consumed directly on-site, representing 81.0 % of the solar energy generated.
- 9.1.6. The building insurer will need to be engaged in the next phase to seek approval and ensure the design complies with any specific requirements they may have.
- 9.1.7. Early engagement with the DNO will also help to understand any restrictions that may be applicable at the site, such as capacity or a requirement of 0% export, both of which could be a key driver in determining the most applicable system size. Currently, no information is known about the incoming supply capacity, and hence, a formal offer from the DNO as part of the design development phase of this project may be required.
- 9.1.8. The installation of a solar PV system is likely to have a positive impact future changes to process the PV system will allow for increased loads through the electrification of the building and the tenant's roadmap should also be considered for installing alternative technology such as but not limited to electric vehicle charging points, air source heat pumps, and process control and automation.

10. Planning

- 10.1.1. The system typically falls within 2015 Permitted Development (on the assumption that certain parameters are adhered to during the design and construction phase), however, it is advisable and good practice to apply for a Certificate of Lawful Development, also defined by some planning authorities as a Notice of Prior Approval. According to these regulations, the highest part of the solar PV equipment cannot be more than 600mm higher than the highest part of the roof (excluding chimney).
- 10.1.2. A glint/glare study may be required if the site falls within very close proximity of an airport (<10km).

11. Distribution Network Operator (DNO)

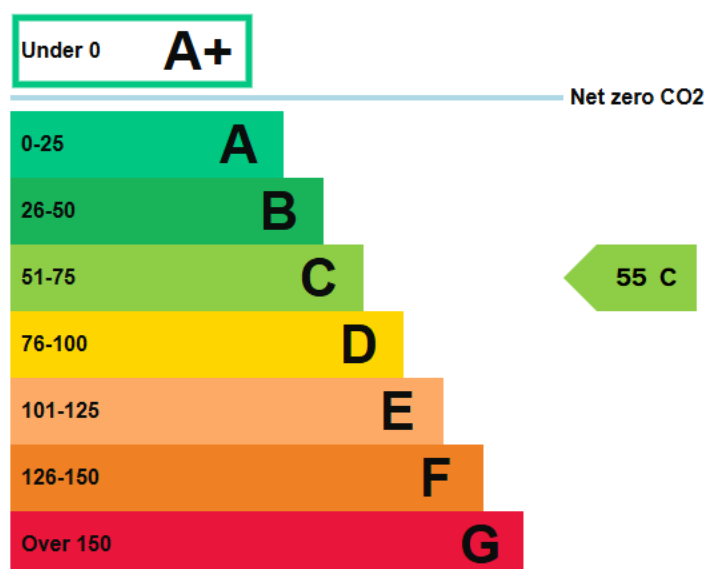
- 11.1.1. An application to connect (G99 Application) to the distribution network needs to be submitted and a connection agreement with the local Distribution Network Operator (DNO) is required before the connection of any solar generation or energy storage device with an output greater than 16A per phase, or any single or multiple EV charge-point installation that increases the maximum demand of a site.
- 11.1.2. The DNO will request a separate G100 relay be installed for systems that do not use type-tested inverters or have multiple inverters. A G100 relay is a voltage and frequency monitoring device that is located between the inverter(s) and the point of connection with the distribution network. A G100 relay will disconnect the inverter(s) from the distribution network when a fault is detected (for example, when the grid voltage is too low/high, a step change in frequency, or loss of mains power) and reconnect when normal operation is resumed.
- 11.1.3. An Export Limitation Scheme measures the active power at points within the Customer's installation and then uses this information to either restrict generation output and/or balance the Customer's demand in order to prevent the export to the Distribution System from exceeding the Agreed Export Capacity.
- 11.1.4. The DNO may request specialist studies as part of the application process called P28 and G5/5, however, this is often not required.

12. EPC

- 12.1.1. The current EPC rating for the building is (55 C)
- 12.1.2. The installation of a PV system is likely to have a positive impact on the Energy Performance Certificate (EPC) rating of the building, which can help with Minimum Energy Efficiency Standard (MEES) ratings when combined with other energy-saving systems.
- 12.1.3. The government's register shows that this building has a Display energy certificate (DEC), completed in August 2015. This provided an energy rating of 65 °c. Installing a PV system will raise this score and potentially increase the energy rating band.
- 12.1.4. The current rating is valid until on 9 May 2033. Hollis recommend carrying out a new EPC assessment, which can take into account the proposed PV system to asses the impact on the EPC rating.
- 12.1.5. The installation of a solar PV system is likely to have a positive impact on the Energy Performance Certificate (EPC) rating of the building, which can help with Minimum Energy Efficiency Standard (MEES) ratings when combined with other energy-saving systems. As the EPC certificate has expired, Hollis recommend carrying out a new EPC assessment, which can caculate the impact of the PV system on the current EPC rating.

Energy rating and score

This property's energy rating is C.



Properties get a rating from A+ (best) to G (worst) and a score.

The better the rating and score, the lower your property's carbon emissions are likely to be.

13. Smart export guarantee (SEG)

- 13.1.1. The Smart Export Guarantee (SEG) was launched by the UK Government, allowing businesses with <5MW capacity to be paid for any PV that is not utilised on site and sent back to the grid as export.
- 13.1.2. This system is predicted to consume all the electricity on site and therefore is unlikely to benefit from the SEG. To enable SEG, a half-hourly smart meter is required to track how much electricity has been exported, as well as an MOP for this meter. These additional costs amount to around £750 per annum. As a result, we recommend not applying for the SEG as it will likely cost money in the long term.

13.2. Next steps

- 13.2.1. The following project next steps have been identified:

STEP 1	▪ All stakeholders to agree on the roof safety access plan. ▪ Review other site-specific hazards, including but not limited to asbestos, overhead pylons, etc. ▪ Solar 3d modelling data checked and amended (if required) with the above data. ▪ Specialist mounting drawings are produced for structural loading and uplift calculations once system sizing and layout are confirmed. ▪ Cable routes to be confirmed with Welltower
STEP 2	▪ G99 DNO Application. ▪ Submission of a certificate of lawful development with local planners. ▪ Appointment of Structural Engineer. ▪ Consult with the insurer about insurance equipment for the PV system
STEP 3	▪ Development of PQQ with performance specification. ▪ ITT and appointment of a specialist contractor.
STEP 4	▪ Detailed construction design. ▪ Review and acceptance of planning and structural assessments. ▪ Construction of solar project (including procurement of materials). ▪ Test, commission, and performance acceptance. ▪ DNO G99 witness testing on site (if required).
STEP 5	▪ Ongoing maintenance.

14. Disclaimer

- 14.1.1. This report is based upon information made available at the time of the survey date and does not constitute a valid design to install against. Further checks, including but not limited to roof measurements, structural, DNO, planning, half-hourly electricity data, and detailed roof drawings will be required prior to proceeding.
- 14.1.2. All costings contained within this report are purely budgetary based upon generic market rates for installation at the time of publication and remote desktop appraisal, these will need to be ratified subject to the above factors via a detailed CAPEX/OPEX breakdown.
- 14.1.3. The performance of solar PV systems is impossible to predict with certainty due to the variability in the amount of solar radiation (sunlight) from location to location and from year to year. It should not be considered a guarantee of performance.
- 14.1.4. Whilst every effort has been made to ensure the accuracy of the information contained within this document, Hollis accepts no responsibility for any discrepancies and omissions that may be contained herein.

15. Project key risks

Risk	Impact	Category	Mitigation and further steps
Asbestos	Low	Safety	Asbestos is not likely to be present in this building as it was constructed after 2000
Roof access and condition	HIGH	Safety Time Cost	- Roof condition survey to establish if any issues. - Existing roof warranties and impact of PV fixings. - Additional access may be required. - Modifications to the mansafe system may be required to allow safe maintenance. - Liaison with tenant to understand site-specific risks and roof access safe working practices.
Roof structure	MEDIUM	Safety Time Cost	- Obtain site structural drawings. - OEM solar mounting design calculation. - Instruct qualified structural engineers. - Use of full rail if required to spread point load. - Adjustments to design (if required).
Roof Insulation	MEDIUM	Safety Time Cost	- Consult with insurer to ensure PV system fits with requirements, taking into account roof materials. - Contact the manufacturer of the insulation to understand if installing the PV system will impact the roof warranty.
System capacity	MEDIUM	Cost	- Further analysis into correct system size. - Electrical drawings to be obtained.
Grid Connection	LOW	Time Capacity	- Early engagement in the design process with DNO and completion of G99 application. - Export G100 requirements (if any). - DNO's P28 and G5/5 requirements (if any). - DNO's G99 relay or reverse power relay requirements (if any).
Planning	LOW	Time Capacity	- Early submission of the planning application. - Full planning required or permitted development? - Is a glint/glare study required?
Specification development	HIGH	Cost Quality Safety	Development of solar specification to ensure best-in-class project is delivered including design, material specification (lifetime costs), and ongoing maintenance strategy.

Risk	Impact	Category	Mitigation and further steps
Solar equipment supply	MEDIUM	Time Cost Quality	- Current supply/demand issues in the solar market have created artificially higher costs for PV equipment. - Increasing output of solar panels means projects may need to be revisited to amend equipment specification between application and installation.
Installation	HIGH	Time Cost Quality	- Ensure a thorough tender process and an accredited MCS contractor is selected. - Solar panels to have genuine MC4 Staubli connectors from a leading bankable Tier1 reputable company. - Inverters to be from a leading supplier with a minimum of a 10-year warranty, ideally with panel-level optimization for greater yield, visibility, and safety. - Fixings to be MCS approved with EPDM rubber seal, ideally using rivets for greater pull-out. - Ensure handover includes a 10-day performance test.
Operation and Maintenance	MEDIUM	Time Cost Quality	- Ensure an accredited installer is appointed. - Optimized systems such as SolarEdge have higher CAPEX but lower OPEX costs allowing for greater yield, visibility remotely, and pinpointing faults to panel level. - Maintenance Safe System of Work (SSOW) to be developed at the design stage to understand client's/tenant's/HSE requirements.

Appendix A

Projected revenue investment proposal Rentalise Option Landlord Pack

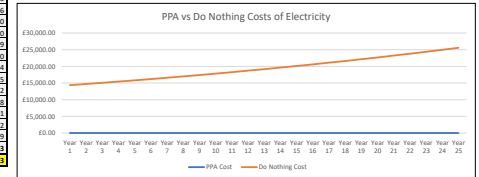
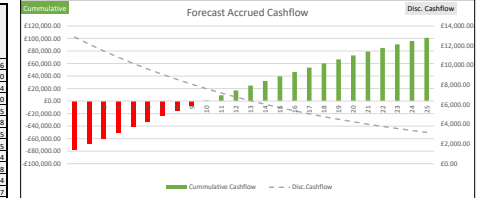
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Rentalisation

Lease Expiry 30/09/35	On Site Consumption 49,034	Tenant Electricity Rate (p/Wh) 29.29	Percentage Discount 95.00%	Annual Rent £0.00	Percentage Increase to Rent 0.00%
Suggested PPA Comparison £0.20		Rentalised Cost (p/kWh) £0.28	Increase Rental Value £13,643.96		

Maintenance Factor (%)	PV Cost Contractor	Hollis Budget Fees	Total Capital Cost
3.0%	\$73,108.98	\$7,698.38	\$80,807.36
Structural Engineer (PSUM)	DNQ Fees (PSUM)	Planning Fees (PSUM)	Total Third Party Fee
\$1,000.00	\$1,200.00	\$1,200.00	\$5,400.00
Export meter installation project management	Export Meter installation cost		
\$0.00	\$0.00		\$0.00
TOTAL INVESTMENT			\$89,862.80

Renaturation Inflation	Electricity Inflation	Export meter (MWh + DC Annual Fee)	Holly Dam O&M Management	Maintenance Inflation	SEG Inflation	Discount Rate		Panel Loss Per Year	Landlord Revenue
						3.0%			
						3.0%	3.0%		
Total	Customer	Annual	Annual	Maintenance Total	Customer	Disc. Charge	Tenant Savings		
\$1,643,964.00	\$1,233,996.00	\$0.00	\$1,300.00	\$0.00	\$2,771,848.00	\$1,658.66	\$1,124.14	\$1,214.14	
\$1,643,964.00	\$2,737,891.00	\$0.00	\$2,776.76	\$0.00	\$4,486,366.00	\$1,214.07	\$1,772.83	\$9,332.00	
\$1,643,964.00	\$4,093,873.00	\$0.00	\$4,931.35	\$2,805.00	\$5,290,244.00	\$1,455.73	\$2,484.09	\$9,194.00	
\$1,643,964.00	\$5,527,842.00	\$0.00	\$6,839.09	\$2,945.87	\$6,473,681.00	\$1,007.02	\$3,054.32	\$8,954.32	
\$1,643,964.00	\$6,812.78.00	\$0.00	\$6,888.24	\$3,014.24	\$4,422,660.00	\$1,105.96	\$2,826.04	\$8,726.04	
\$1,643,964.00	\$8,186.73.00	\$0.00	\$7,123.25	\$3,127.27	\$3,462,848.00	\$916.85	\$3,292.27	\$8,779.27	
\$1,643,964.00	\$9,502.48.00	\$0.00	\$7,318.08	\$3,218.08	\$2,494,660.00	\$843.52	\$3,643.52	\$8,643.52	
\$1,643,964.00	\$10,935.15.00	\$0.00	\$7,484.81	\$3,315.00	\$1,626,460.00	\$650.93	\$4,156.41	\$8,416.41	
\$1,643,964.00	\$12,729.60.00	\$0.00	\$8,000.16	\$3,415.07	\$979,272.00	\$579.84	\$4,508.80	\$8,328.80	
\$1,643,964.00	\$14,646.48.00	\$0.00	\$8,527.16	\$3,512.52	\$574,640.00	\$489.64	\$4,819.64	\$8,189.64	
\$1,643,964.00	\$15,000.51.00	\$0.00	\$8,615.87	\$3,621.04	\$379,787.00	\$387.47	\$5,097.43	\$8,097.43	
\$1,643,964.00	\$16,163,727.47.00	\$0.00	\$10,076.35	\$3,713.73	\$1,611,611.00	\$46,780.63	\$5,968.20	\$7,831.20	
\$1,643,964.00	\$17,327,372.47.00	\$0.00	\$11,388.64	\$3,806.00	\$823,660.00	\$68,824.63	\$5,660.64	\$7,660.64	
\$1,643,964.00	\$18,515.05.38.00	\$0.00	\$12,300.00	\$3,955.00	\$523,555.00	\$83,638.73	\$5,059.13	\$7,458.13	
\$1,643,964.00	\$20,045.69.34.00	\$0.00	\$2,188.88	\$4,077.77	\$278,000.00	\$5,694.15	\$7,429.83	\$7,291.83	
\$1,643,964.00	\$21,819.32.29.00	\$0.00	\$2,186.95	\$4,200.00	\$150,000.00	\$5,170.80	\$7,642.65	\$7,108.65	
\$1,643,964.00	\$23,194.77.00	\$0.00	\$2,407.00	\$4,336.10	\$85,472.20	\$4,656.66	\$7,819.34	\$6,919.34	
\$1,643,964.00	\$24,591.20.00	\$0.00	\$2,472.27	\$4,455.89	\$48,000.00	\$4,780.08	\$8,026.06	\$6,706.06	
\$1,643,964.00	\$25,926.16.00	\$0.00	\$2,480.32	\$4,589.56	\$27,000.00	\$4,509.50	\$8,037.25	\$6,504.25	
\$1,643,964.00	\$27,870.18.00	\$0.00	\$2,480.32	\$4,721.25	\$15,000.00	\$4,254.24	\$8,078.24	\$6,254.24	
\$1,643,964.00	\$28,851.07.00	\$0.00	\$2,709.17	\$4,869.07	\$8,000.00	\$4,013.44	\$8,000.00	\$6,013.44	
\$1,643,964.00	\$30,017.42.00	\$0.00	\$2,490.44	\$5,015.14	\$4,484.73.00	\$3,786.47	\$1,132.63	\$5,836.36	
\$1,643,964.00	\$31,830.18.00	\$0.00	\$2,474.16	\$5,165.39	\$2,477.91.00	\$3,277.91	\$1,894.89	\$5,600.89	
\$1,643,964.00	\$32,754.84.00	\$0.00	\$2,960.18	\$5,320.56	\$1,484.73.00	\$3,769.76	\$1,212.04	\$5,436.36	
\$1,643,964.00	\$34,109.89.00	\$0.00	\$3,049.13	\$5,480.18	\$1,000,000.00	\$4,179.02	\$1,137.78	\$5,117.78	
					\$4,596.87.00	\$4,596.87.00	\$1,000,000.00	\$1,000,000.00	
					\$29,209.20.00	\$29,209.20.00	\$1,000,420.70	\$1,001,643.00	

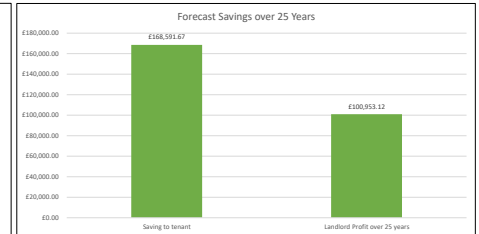
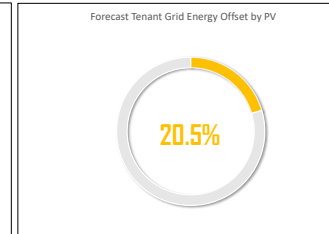


Percentage of PV Consumed on Site



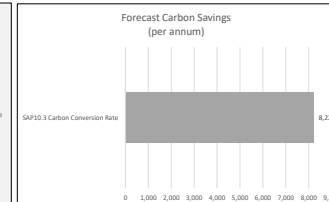
A donut chart with a green segment representing 81% and a grey segment representing the remaining 19%. The text '81%' is displayed in the center of the chart.

Category	Percentage
PV Consumed on Site	81%
Other	19%



Forecast Energy Offset

Category	Value (kWh)
Billing data per annum kWh/PA	238,750
Total Solar Generation Consumed on Site	-95,034
Grid Export	-11,476



Disclaimer:

All costings contained within this report are purely budgetary based upon based upon generic market rates for installation at the time of publication, these will need to be ratified subject to the above factors via a detailed CAPEX/OPEX breakdown.

The performance of solar PV systems is known to be variable due to the variability in the amount of solar radiation (sunlight from location to location and from year to year). It should not be considered as a guarantee of performance.

Whilst every effort has been made to ensure the accuracy of the information contained within this document, Hollis accepts no responsibility for any discrepancies and omissions which may be contained herein.

Appendix B

Projected revenue investment proposal
Rentalise Option Tenant Pack

Solar PV System Summary

HOLLIS

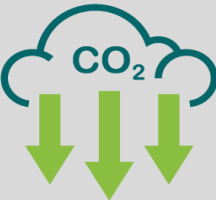
Project number 131569-100
Project Description Units 1A and 1B, Mendalgief Retail Park, Newport, NP20 2NW
Client Columbia Threadneedle Investments
Contact Tim John
Address Units 1A and 1B, Mendalgief Retail Park, Newport, NP20 2NW

Carbon (CO₂)

8.2

Saving Per Annum*

tonnes/PA



Solar PV

Generation Per Annum*

64.80

kWp

60,510

kWh/PA



Electricity

Forecast Savings During Lease

£1,407

Year 1

£5,043

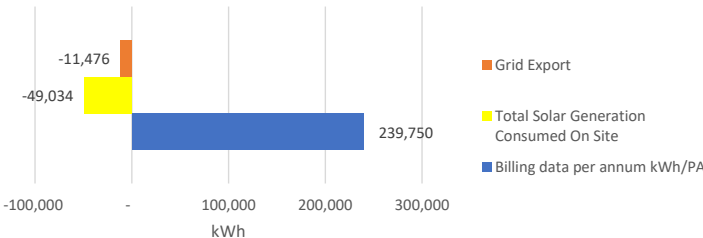
Year 10

£31,665

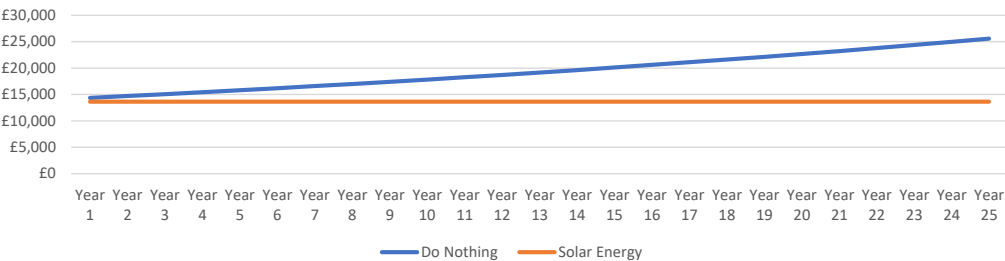
Total Savings



Energy Offset



Solar vs Do Nothing Costs of Electricity



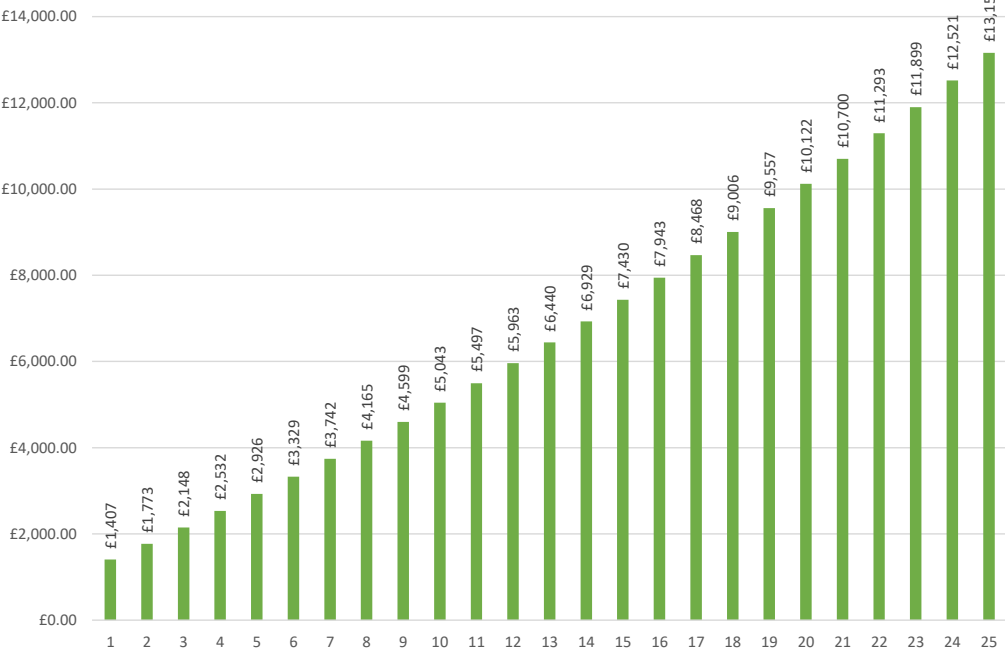
Percentage of PV Consumed on Site



Forecast Grid Energy Offset by PV



Forecast Tenant Savings



*The performance of solar PV systems is impossible to predict with certainty due to the variability in the amount of solar radiation (sunlight) from location to location and from year to year. It should not be considered as a guarantee of performance.

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*Forecast figures based upon modelling data and following key variables:

Additional uplift in rental value (p.a) for solar PV system:

£13,643.96

Assumed Inflation Rate

0%

Assumed existing incoming grid electricity supply rate in Year one:

29.29 p/kWh

3%

PV Payback Calculator V5.0 / © Hollis Global, 2022

Appendix C

Projected revenue investment proposal
PPA Option Landlord Pack

SOLAR PV - INVESTMENT ANALYSIS

Power Purchase Agreement (PPA)

HOLLIS

Project number 131569-100
Project Description Units 1A and 1B, Mendalgef Retail Park, Newport, NP20 2NW
Client Columbia Threadneedle Investments
Contact Tim John
Address Units 1A and 1B, Mendalgef Retail Park, Newport, NP20 2NW

Data input fields (see comments for help)

System Size (kWp)		PPA Rate		Rental/Lease		Forecast Grid Supply		Smart Export Guarantee (SEG)	
Year	Generation (kWh)	Consumption (kWh)	PPA	Rent Value	Market Rate	SEG	Exported kWh		
Year 1	60,510	49,034	0.2000	£13,643.96	0.2929	0.0600	11,476	£688.56	
Year 2	60,177	48,764	0.2000	£13,643.96	0.2929	0.0600	11,476	£688.56	
Year 3	59,846	48,496	0.2122	£10,340.31	0.3107	0.0637	11,390	£722.48	
Year 4	59,515	48,229	0.2185	£10,340.31	0.3201	0.0656	11,284	£740.06	
Year 5	59,189	47,964	0.2251	£10,340.31	0.3297	0.0675	11,226	£758.07	
Year 6	58,864	47,700	0.2319	£10,340.31	0.3396	0.0696	11,164	£776.32	
Year 7	58,540	47,438	0.2388	£10,340.31	0.3497	0.0716	11,102	£795.43	
Year 8	58,218	47,177	0.2460	£10,340.31	0.3602	0.0738	11,041	£814.77	
Year 9	57,898	46,918	0.2534	£10,340.31	0.3710	0.0760	10,981	£834.40	
Year 10	57,580	46,660	0.2610	£10,340.31	0.3822	0.0783	10,920	£854.38	
Year 11	57,263	46,403	0.2688	£10,340.31	0.3936	0.0806	10,860	£875.11	
Year 12	56,948	46,148	0.2768	£10,340.31	0.4054	0.0831	10,800	£897.02	
Year 13	56,635	45,894	0.2852	£10,340.31	0.4176	0.0859	10,741	£918.86	
Year 14	56,323	45,641	0.2937	£10,340.31	0.4301	0.0889	10,682	£941.21	
Year 15	56,014	45,390	0.3024	£10,340.31	0.4430	0.0920	10,624	£964.52	
Year 16	55,706	45,141	0.3116	£10,340.31	0.4563	0.0955	10,565	£988.78	
Year 17	55,399	44,893	0.3210	£10,340.31	0.4700	0.0993	10,507	£1,013.45	
Year 18	55,095	44,646	0.3306	£10,340.31	0.4841	0.1032	10,449	£1,038.63	
Year 19	54,792	44,400	0.3405	£10,340.31	0.4986	0.1071	10,391	£1,064.35	
Year 20	54,490	44,156	0.3507	£10,340.31	0.5136	0.1112	10,334	£1,090.78	
Year 21	54,190	43,913	0.3612	£10,340.31	0.5290	0.1154	10,277	£1,117.94	
Year 22	53,892	43,671	0.3721	£10,340.31	0.5449	0.1201	10,221	£1,145.84	
Year 23	53,596	43,431	0.3832	£10,340.31	0.5612	0.1250	10,165	£1,184.60	
Year 24	53,301	43,192	0.3947	£10,340.31	0.5781	0.1304	10,109	£1,224.37	
Year 25	53,008	42,955	0.4066	£10,340.31	0.5954	0.1363	10,053	£1,265.17	
25 Yrs	1,416,934			£332,108.17			£486,372.41	£23,318.15	

FINANCIAL SUMMARY		25.0 Yrs
Lifetime cost of energy for PV system (CAPEX/total generation)		0.1910 £ p/kWh
Net Present Value (NPV)		£77,831.75
Saving to tenant		£154,264.24
Average saving to tenant		£170.569777
Landlord Profit over 25 years		£84,822.20
Buy 1 Yield on Cost (Year One)		11.62%

Carbon		g CO ₂ /kWh	Per annum	Lifetime	Eq. Number of Trees
Carbon saved per annum	SAP10.3 Carbon Conversion Rate	136.00	8,229	192,711	0
					0

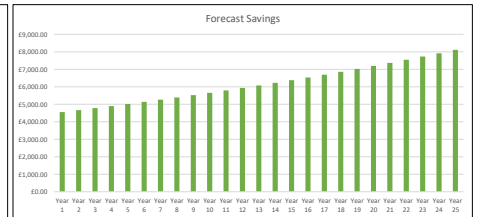
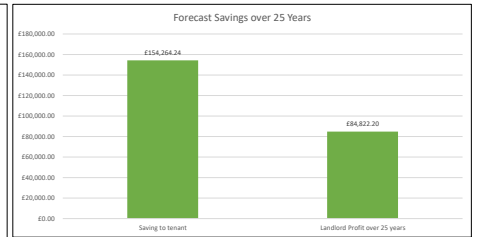
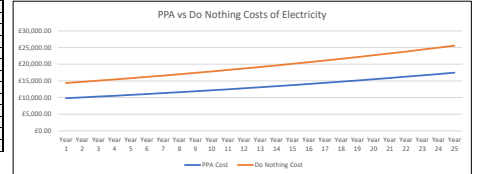
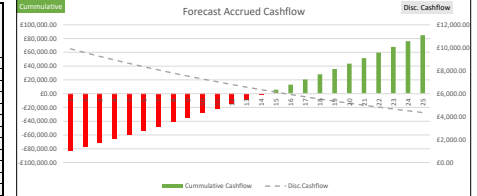
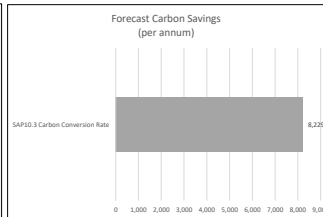
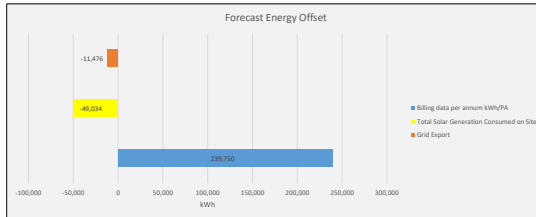
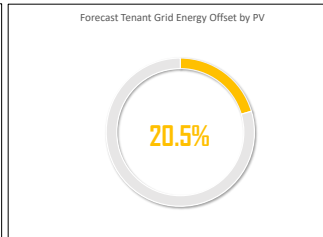
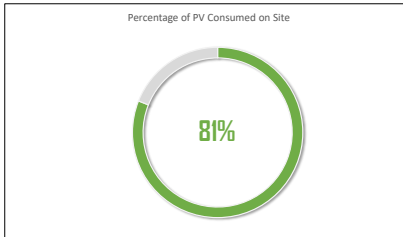
Energy Consumption Models		Energy kWh	PV Offset (all PV)	PV Offset (PV used)
Billing data per annum kWh/PA		239,750	25%	20%
Forecast electricity demand (METS benchmark) kWh/PA		0		
Forecast electricity demand (EPC) kWh/PA		0		
Unmet		79,517	25%	20%

What's produced/needed		239,750	25%	81%	19%
Billing data per annum kWh/PA		239,750			
Total Solar Generation		60,510			
Total Solar Generation Consumed on Site		40,034			
Grid Export		20,476			

Disclaimer:
All costings contained within this report are purely budgetary based upon generic market rates for installation at the time of publication, these will need to be ratified subject to the above factors via a detailed CAPEX/OPEX breakdown.
The performance of solar PV systems is impossible to predict with certainty due to the variability in the amount of solar radiation (sunlight) from location to location and from year to year. It should not be considered as a guarantee of performance.
Whilst every effort has been made to ensure the accuracy of the information contained within this document, Hollis accepts no responsibility for any discrepancies and omissions which may be contained herein.

Maintenance Factor (%)		PV Cost/Constructor	Hollis Budget Fees	Total Capital Cost
3.0%		£71,108.58	£7,498.38	£78,606.96
Structural Engineer (PSUM)		£1,200.00	£1,200.00	£2,400.00
Export meter installation		£250.00		£250.00
project management		£1,200.00		£1,200.00
TOTAL INVESTMENT				£83,456.96

PPA Inflation	Electricity Inflation	Export meter (MOP + DC) Annual Fees	Hollis O&M Management	Maintenance Inflation	SEG Inflation	Discount Rate	Panel Loss Per Year	Landlord Revenue
3.0%	3.0%	£747.25 p.a.	£1500.00 p.a.	3.0%	3.0%	6.0%	0.55%	
Total Income	Cumulative	Annual	Annual	Maintenance Total	Cumulative Cashflow	Disc. Cashflow	Tenant Savings	
£10,495.36	£10,495.36	£747.50	£1,500.00	£0.00	£81,004.94	£9,501.28	£4,555.26	£8,247.86
£10,740.76	£21,246.12	£775.50	£1,545.00	£2,821.57	£77,459.97	£9,546.14	£4,686.11	£5,908.27
£11,012.38	£32,258.51	£799.38	£1,591.35	£2,806.21	£74,744.21	£9,266.21	£4,779.68	£5,735.44
£11,280.37	£43,538.88	£823.37	£1,639.09	£2,893.40	£71,916.72	£8,935.11	£4,895.97	£5,524.51
£11,554.88	£55,093.76	£848.07	£1,688.26	£3,083.20	£68,981.38	£8,614.48	£5,015.12	£5,335.34
£11,836.07	£66,929.83	£873.51	£1,738.91	£3,175.76	£65,946.44	£8,313.16	£5,047.85	£5,047.85
£12,124.10	£79,053.92	£899.72	£1,791.08	£3,270.97	£62,771.10	£8,063.22	£5,262.32	£4,762.11
£12,419.14	£91,473.06	£926.71	£1,844.81	£3,369.10	£59,492.58	£7,791.92	£5,390.23	£4,478.52
£12,721.36	£104,194.42	£954.51	£1,900.16	£3,470.17	£56,094.98	£7,549.73	£5,521.40	£4,186.52
£13,030.19	£117,225.35	£983.15	£1,957.10	£3,574.27	£52,598.74	£7,276.40	£5,655.76	£3,886.33
£13,348.04	£130,573.39	£1,012.64	£2,015.87	£3,681.50	£49,041.68	£7,001.58	£5,793.40	£3,582.02
£13,672.86	£144,246.25	£1,043.02	£2,076.35	£3,791.95	£45,380.14	£6,794.99	£5,934.38	£3,276.34
£14,009.55	£158,251.84	£1,074.33	£2,139.64	£3,905.71	£41,626.21	£6,566.37	£6,078.79	£2,969.92
£14,348.42	£172,598.26	£1,106.54	£2,205.80	£4,022.88	£37,784.43	£6,345.43	£6,236.72	£2,654.00
£14,689.54	£187,293.80	£1,139.74	£2,268.88	£4,141.56	£33,864.34	£6,141.93	£6,378.25	£2,341.33
£15,033.15	£202,346.95	£1,173.93	£2,336.95	£4,262.87	£29,881.75	£5,925.62	£6,533.46	£2,024.40
£15,384.47	£217,766.43	£1,209.15	£2,407.06	£4,386.91	£25,762.24	£5,726.24	£6,692.45	£1,707.36
£15,738.71	£233,561.13	£1,245.42	£2,479.27	£4,512.78	£21,546.94	£5,533.58	£6,855.31	£1,384.21
£16,097.07	£249,740.20	£1,282.78	£2,553.65	£4,643.62	£17,280.33	£5,347.39	£7,022.14	£1,059.02
£16,572.78	£266,312.99	£1,321.27	£2,630.26	£4,803.51	£12,946.99	£5,167.42	£7,193.02	£7,193.02
£16,976.09	£283,289.06	£1,360.90	£2,709.17	£4,947.63	£8,544.47	£4,991.63	£7,368.08	£7,368.08
£17,389.20	£300,678.28	£1,401.21	£2,790.44	£5,096.08	£4,064.44	£4,825.59	£7,547.36	£8,100.06
£17,817.37	£318,490.64	£1,443.78	£2,874.16	£5,248.94	£0,788.92	£4,663.23	£7,731.03	£8,245.48
£18,245.81	£336,738.47	£1,487.10	£2,960.39	£5,406.41	£-7,421.86	£4,506.31	£7,919.18	£8,393.89
£18,689.84	£355,026.52	£1,531.71	£3,049.19	£5,568.60	£-16,622.20	£4,354.71	£8,111.88	£8,540.14
				£97,136.55			£154,264.24	£176,135.00



Appendix D

Projected revenue investment proposal PPA Option Tenant Pack

Solar PV System Summary

HOLLIS

Project number131569-100

Project DescriptionUnits 1A and 1B, Mendalgief Retail Park,Newport, NP20 2NW

ClientColumbia Threadneedle Investments

ContactTim John

AddressUnits 1A and 1B, Mendalgief Retail Park,Newport, NP20 2NW

Carbon (CO₂) Saving

Per Annum*

8.2

tonnes/PA

Solar PV Generation

Per Annum*

64.80

kWp

60,510

kWh/PA

Electricity

Forecast Savings Yrs 1-25*

£4,555

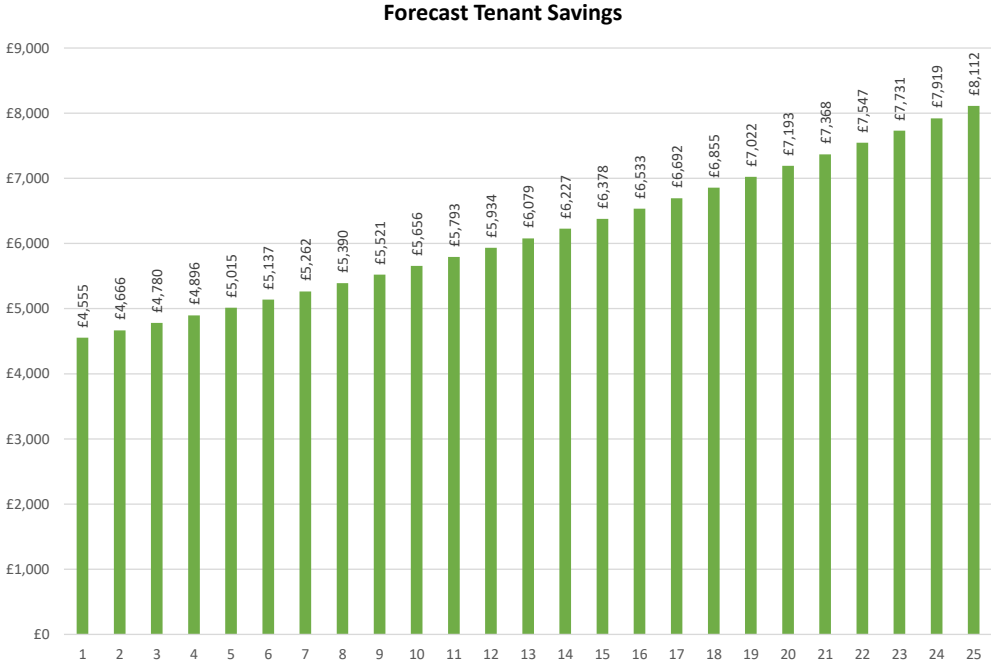
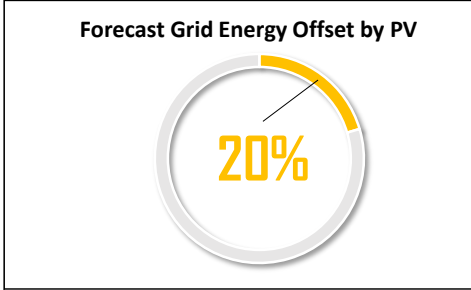
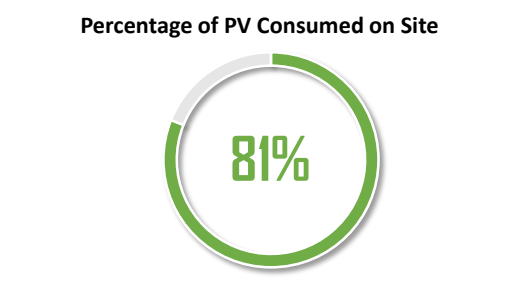
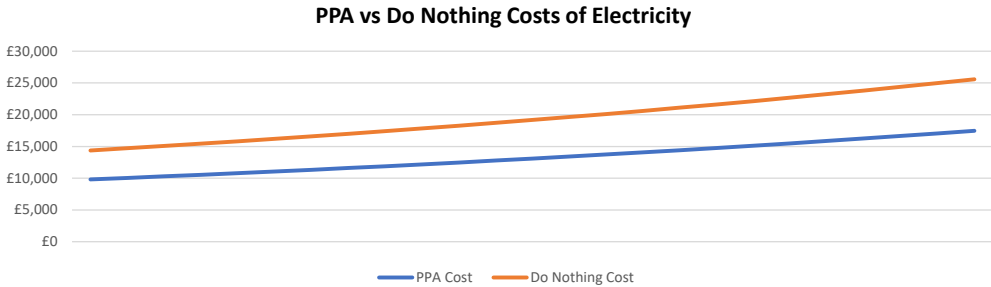
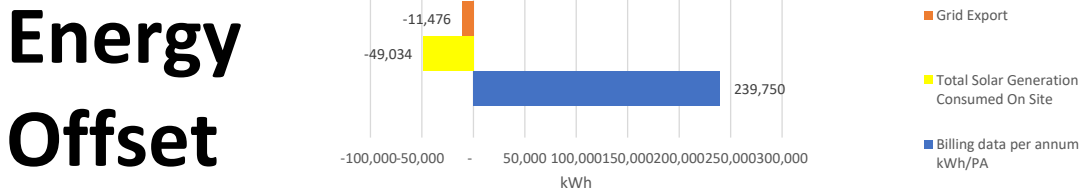
Year 1

£5,656

Year 10

£154,264

Total Years 1-25



*The performance of solar PV systems is impossible to predict with certainty due to the variability in the amount of solar radiation (sunlight) from location to location and from year to year. It should not be considered as a guarantee of performance.

Whilst every effort has been made to ensure the accuracy of the information contained within this document, Hollis accepts no responsibility for any discrepancies and omissions which may be contained herein.

*Forecast figures based upon modelling data and following key variables:

Power Purchase Agreement (PPA) for solar energy produced and sold back to occupier:	£0.20	£/kWh	Assumed Inflation Rate	3.00%
Assumed existing incoming grid electricity supply rate in Year one:	£0.29	£/kWh		3.00%

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