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Agenda

Environment and Climate Change Committee Meeting

Date: Thursday, 3 October 2024
Time 7.00 pm
Venue: Council Chamber, Swale House, East Street, Sittingbourne, ME10 3HT

Membership:

Councillors Roger Clark, Carole Jackson, Rich Lehmann (Chair), Claire Martin, Charlie Miller, Pete Neal, Chris Palmer, Hannah Perkin, Ashley Shiel, Julien Speed, Paul Stephen, Sarah Stephen, Angie Valls, Ashley Wise and Dolley Wooster (Vice-Chair).

Quorum = 5

Pages

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1. Emergency Evacuation Procedure

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(a) The fire alarm is a continuous loud ringing. In the event that a fire drill is planned during the meeting, the Chair will advise of this.

(b) Exit routes from the chamber are located on each side of the room, one directly to a fire escape, the other to the stairs opposite the lifts.

(c) In the event of the alarm sounding, leave the building via the nearest safe exit and gather at the assembly point on the far side of the car park. Do not leave the assembly point or re-enter the

building until advised to do so. Do not use the lifts.

(d) Anyone unable to use the stairs should make themselves known during this agenda item.

2. Apologies for Absence

3. Minutes

To approve the Minutes of the meeting held on 16 July 2024 (Minute Nos. 92 – 97) as a correct record.

4. Declarations of Interest

Councillors should not act or take decisions in order to gain financial or other material benefits for themselves, their families or friends.

The Chair will ask Members if they have any disclosable pecuniary interests (DPIs) or disclosable non-pecuniary interests (DNPIs) to declare in respect of items on the agenda. Members with a DPI in an item must leave the room for that item and may not participate in the debate or vote.

Aside from disclosable interests, where a fair-minded and informed observer would think there was a real possibility that a Member might be biased or predetermined on an item, the Member should declare this and leave the room while that item is considered.

Members who are in any doubt about interests, bias or predetermination should contact the monitoring officer for advice prior to the meeting.

5. Waste Scrutiny Review Progress - Verbal Update

Issued on Wednesday, 25 September 2024

The reports included in Part I of this agenda can be made available in alternative formats. For further information about this service, or to arrange for special facilities to be provided at the meeting, please contact **democraticservices@swale.gov.uk**. To find out more about the work of this meeting, please visit www.swale.gov.uk

Chief Executive, Swale Borough Council,
Swale House, East Street, Sittingbourne, Kent, ME10 3HT

Environment and Climate Committee	
Meeting Date	3 October 2024
Report Title	**Solar Panels – Swale House**
SMT Lead	Emma Wiggins Director of Regeneration and Neighbourhoods
Head of Service	Joanne Johnson, Head of Place
Lead Officer	Deborah Hardy, Building Operations and Maintenance Manager
Classification	**Open**
Recommendations	1) To recommend to Policy and Resources Committee to allow and delegate to the Director of Resources to use reserves up to £100,000 on an invest to save basis to provide solar panel coverage at Swale House with a payback of no longer than 5 years. 2) To delegate to the Director of Regeneration and Neighbourhoods the preparation and award of a contract for the delivery of solar panels on Swale House subject to agreement of recommendation 1.

1 Purpose of Report and Executive Summary

1.1 This report sets out the invest to save business case for the installation of solar panels on Swale House.

1.2 As part of the Climate Emergency Action Plan there is an action to investigate ways of decarbonising Swale House and this report sets out how this can be achieved.

2 Background

2.1 On 26 June 2019 Swale Borough Council declared a Climate and Ecological Emergency. The council set one of the most ambitious targets in the country to be carbon neutral by 2025 and achieve net zero borough wide by 2030.

2.2 The first priority in the top ten priorities in the action plan is to **Retro-fit Swale House to cut carbon emissions (e.g. extra insulation, triple glazing, heat pump, solar PV).**

2.3 Insulation and glazing works were successfully undertaken throughout 2022. Swale House's Display Energy Certificate Rating has since been regraded from C to B.

2.4 The council was offered the opportunity to have a piece of work undertaken at no cost to investigate whether there is a financially viable business case to install solar panels on Swale House on an invest to save basis.

2.5 The business case is set out in appendix 1 and sets out the scope for installation of 6 separate PV arrays laid out across various roofs on Swale House, with a combined nominal output of 124.1 kWp. This utilises all the accessible flat roof surfaces and takes into account shading from buildings, a flagpole and several antennae.

2.6 The council is undertaking other investigations to identify which other buildings could be suitable to house solar panels and has a well-developed tender specification.

2.7 The overall electricity self- consumption rate is estimated at 89.6%, i.e. of the total power generated by the PV array, we can expect 89.6% to be utilised on site at Swale House, displacing power that would otherwise need to be imported from the grid. At the prevailing day-time tariff rate of 29.105 p/kWh this would be expected to save £30,553 annually. On this basis the PV array would achieve a self-sufficiency rate of 50.0%, i.e. we would expect the PV array to supply around 50% of the total electricity consumed by Swale House (209,897 kWh, day and night). In addition, between April and August surplus PV generation (~12,153 kWh) would be exported back to the grid. At a day-time export tariff rate of 18 p/kWh (e.g. Octopus Flux) this could be worth an additional £2,153 pa. Therefore, the estimated total benefit from the PV array would be in the region of £32,740 annually.

2.8 The main items of equipment required for this project are

- 292 x PV panels,
- 6 x inverters,
- an export power manager,
- roof mounting equipment,
- ballast
- electrical switchgear and sundries.

2.9 The price of this has been estimated at £47,000 (ex VAT). However, this cost excludes any supplier margin on equipment and a final price would need to be established through a tender procurement process as per our contract standing orders.

2.10 Estimated design, installation and commissioning costs for an array of this capacity are likely to be in the region of £20,000 (ex VAT). In practice suppliers will charge a margin over wholesale prices on equipment which could be more than 30%, depending upon how competitively the selected contractor is prepared to price for the project. Allowing for a 30% margin on the cost of equipment, the overall project cost could be in the region of £81,000 (ex VAT, subject to market testing). This does not include any project financing/opportunity costs or internal administration costs. It also does not include any costs for ongoing maintenance, albeit in practice these ought to be minimal (~£500 pa).

3 Proposals

3.1 To recommend to Policy and Resources Committee to allow and delegate to the Director of Resources to use reserves up to £100,000 on an invest to save basis to provide solar panel coverage at Swale House with a payback of no longer than 5 years.

3.2 To delegate to the Director of Regeneration and Neighbourhoods the preparation and award of contract for the delivery of solar panels on Swale House subject to agreement of recommendation 1.

4 Alternative Options

4.1 That the council does not proceed with solar panels on Swale House – this is not recommended as to do so would not meet our climate emergency commitment and would cost more in the longer term.

5 Consultation Undertaken or Proposed

5.1 No specific consultation has been undertaken.

6 Implications

Issue	Implications
Corporate Plan	This project is part of the Environment section of the corporate plan as forms part of the annual delivery plan 2024-25
Financial, Resource and Property	Based on savings (section 7 of the business case) and costs (section 8 of the business case), excluding any project financing costs, the simple undiscounted payback period is likely to be in the region of 2.5 years, depending upon the terms that can be negotiated with the preferred contractor. Based on these projected costs and revenues the project achieves an Internal Rate of Return (IRR) of 38.91% after 10 years. Increases in the cost of electricity which occur post installation will improve the rate of return on investment. Likewise, a fall in the cost of electricity would reduce the rate of return.
Legal, Statutory and Procurement	None identified at this stage.
Crime and Disorder	None identified at this stage.
Climate and Ecological Emergency	If we proceed with this project, it will assist us to meet the priorities set out in the Climate and Ecological Emergency Action plan declared in June 2019. It also helps us show an environmental stewardship role, encouraging other local businesses to follow suit.
Health and Wellbeing	None identified at this stage.

Risk Management and Health and Safety	None identified at this stage.
Equality and Diversity	None identified at this stage.
Privacy and Data Protection	None

7 Appendices

Appendix 1 – PV array – cost benefit analysis

8 Background Papers

The author of this report has not relied on any background papers that are not either attached to this report or are in the public domain.

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Swale House – 124.1 kWp PV Array - DRAFT

Executive Summary

I expect a 124.1 kWp PV array to generate in the region of 117,128 kWh pa, offsetting ~50% of the electricity currently consumed in Swale House annually. Just under 90% of the electricity generated by the array would be used on site with the remaining 10% exported to grid. At current electricity prices the savings/revenue generated by the array would be worth just over £32,740 annually. I would expect an investment in the region of £81,000 to reach payback between 2.5 to 3 years, depending on the cost of financing, with an internal rate of return approaching 40% after 10 years.

1. Background

The objective of this report is to provide evidence to establish, against a backdrop of severe constraints on local government funding, whether there is sufficient financial justification for Swale Borough Council to invest in installation of a large PV array on the roof of its headquarters building, Swale House.

It is the first of a series of reports for buildings owned/operated by Swale Borough Council.

This report has been prepared based on 13 years of experience with Invicta Clean Energy Ltd as a designer and installer of PV systems and with access to up-to-date pricing from one of the UK's largest and most longstanding wholesalers of PV equipment. However it is noted that this advice has been offered independently of my role as an installer.

2. Scope

Further to my recent site visit I have Identified scope for installation of 6 separate PV arrays laid out across various roofs on Swale House, with a combined nominal output of 124.1 kWp. This utilises all the accessible flat roof surfaces and takes into account shading from buildings, a flagpole and several antennae.

The purpose of this report is to provide an outline specification and estimated costs for the arrays, estimates of their annual generation and to compare these to actual electricity consumption. From these the likely rates of self-consumption and self-sufficiency can be determined. This allows the prospective annual revenue (savings) to be estimated and compared to the estimated capital outlay to determine the project's simple payback period and IRR.

Because the proposed PV array achieves a relatively high self-consumption rate (89.6%, see Section 7 below), which means the surplus generated by the array over day-time uses would be relatively small, I have excluded battery storage from this specification. It would be possible to retrofit battery storage at a later date.

3. PV Array Layout

The roof survey identified 6 separate areas, each of which would be suitable for mounting a PV array, as set out in Figure 1 and Table 1 below. These are categorised according to level; A = lower level, B = upper level, C = roof of plant room 1. These areas have been selected taking into account shading from buildings (plant rooms 1 and 2 and the stairwells), a flagpole, antennae and also the need for access. They have been divided into 11 separate sub-arrays reflecting areas with (A2, B2, B4, B5, C1) and without (A1, A3, B1, B3, B6, C2) significant shading.

*Table 1 – Sub-arrays, shading, nominal capacity and number of PV modules

	Location	Shading	Array kWp	# of modules
A1	Lower level front	No significant shading	31.025	73
A2, A3	Lower level rear	Shading at front from stairwell building (A2), no shading at rear (A3)	23.375	55
B1	Top level front	No significant shading	2.125	5
B2, B3, B4	Top level middle	Shading from Plant Rm 1 (B4) and Plant Rm 2 (B6); no significant shading in middle section (B5).	27.2	64
B5, B6	Top level rear	Shading at front from Plant Rm 2 (B5), no shading at rear (B6)	21.25	50
C1, C2	Roof of plant room 1	Shading at front from flag pole and weather station antenna (C1); no shading at rear (C2).	19.125	45

Figure 1 – Swale House Roof PV Layout

4. Equipment and Design

The system design uses an Esdec Flat Fix Fusion mounting system with panels at 13° inclination (see Appendix 1). Panel orientation is SSW, 195°. A benefit of this mounting system is that it minimises the requirement for ballast.

The photovoltaic modules used in this analysis are JA Solar 425Wp Mono PERC Half-cell MBB LR Black Frame (see Appendix 2).

Each of the 6 arrays would have its own Solis 5G 3-phase inverter (see Appendix 3). These would be connected to grid via existing 3-phase sub-distribution boards in Plant Room 1 and Plant Room 2. Shaded and unshaded sub-arrays would be connected to separate MPPTs on the inverter. These would be linked by an Export Power Manager.

A system administrator would monitor the performance of each of the arrays using an online portal.

The equipment specified in this analysis conforms to industry standards. However it is likely that a contractor selected to undertake the project will propose alternatives.

5. PV Annual Generation

The estimated annual output for each of the 11 sub-arrays is set out in Table 2 below, taking into account inclination, orientation and shading (a shade factor of 0.75 has been applied to derate the output of the shaded sub-arrays). The overall estimated annual output of the combined 124.1 kWh array is 117,128 kWh.

Table 2 - Estimated Annual Output for PV Sub-Arrays

A. Installation data Total	A1	A2	A3`	B1	B2	B3	B4	B5	B6	C1	C2	Total	
Installed capacity of PV system - kWp (stc)	31.025	14.875	8.5	2.125	8.925	9.35	8.925	6.375	14.875	6.375	12.75	124.1	kWp
Degrees from south	15	15	15	15	15	15	15	15	15	15	15		°
Inclination of system - degrees from horizontal	13	13	13	13	13	13	13	13	13	13	13		°
Postcode region	2	2	2	2	2	2	2	2	2	2	2		
B. Calculations													
kWh/kWp (Kk) from table	1039	1039	1039	1039	1039	1039	1039	1039	1039	1039	1039		kWh/kWp
Shade Factor (SF)	1	0.75	1	1	0.75	1	0.75	0.75	1	0.75	1		
Estimated annual output (kWp x Kk x SF)	32235	11591	8832	2208	6955	9715	6955	4968	15455	4968	13247	117128	kWh
C. Other data													
CO2 saving	18.31	6.58	5.02	1.25	3.95	5.52	3.95	2.82	8.78	2.82	7.52	67	tonnes CO_2
Estimated savings per annum*	£8,528.23	£3,066.66	£2,336.50	£584.13	£1,839.99	£2,570.15	£1,839.99	£1,314.28	£4,088.88	£1,314.28	£3,504.75	£30,988	*
Estimated export income per annum (SEG)**	£528.01	£189.87	£144.66	£36.16	£113.92	£159.13	£113.92	£81.37	£253.15	£81.37	£216.99	£1,919	**
Total estimated savings/income per annum	£9,056.24	£3,256.52	£2,481.16	£620.29	£1,953.91	£2,729.28	£1,953.91	£1,395.65	£4,342.03	£1,395.65	£3,721.74	£32,906	

The overall annual output on Table 2 above is represented in monthly format in Table 3 and Figure 2 below. This facilitates comparison with monthly consumption data. The monthly yield factors used are also presented in the table. These have been derived using output data from monitoring of active PV sites elsewhere in Kent.

Table 3 – Estimated Monthly Output

	kWh	Monthly Yield Factor
Jan	3112	2.7%
Feb	5652	4.8%
Mar	8171	7.0%
Apr	14314	12.2%
May	16133	13.8%
Jun	17247	14.7%
Jul	15053	12.9%
Aug	14610	12.5%
Sep	10634	9.1%
Oct	7092	6.1%
Nov	3420	2.9%
Dec	1689	1.4%
Total	117128	

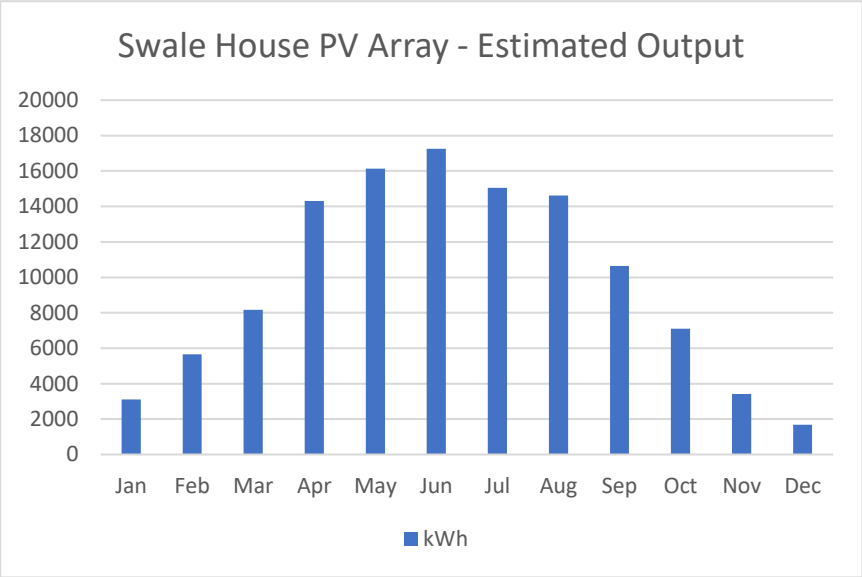


Figure 2 – Estimated Monthly Output

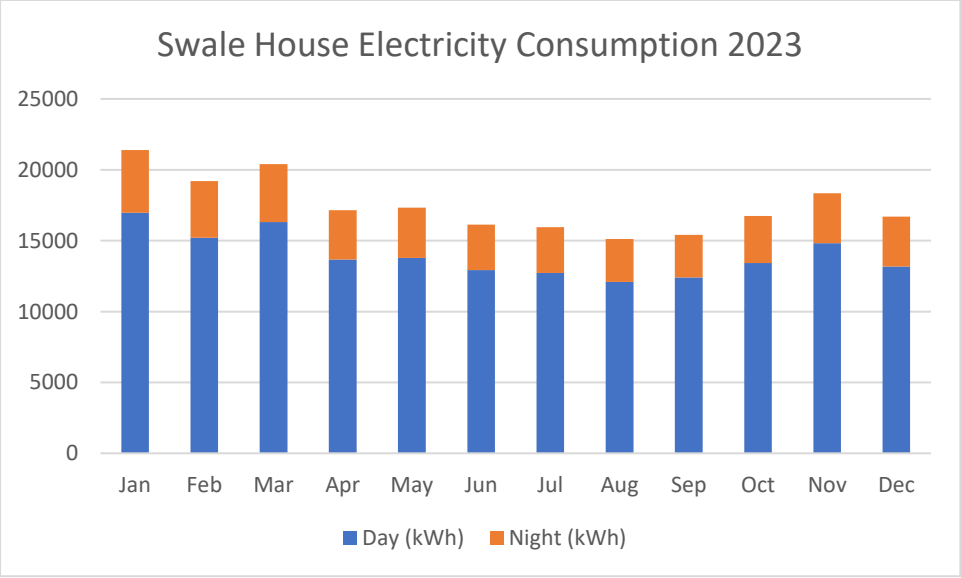
6. Electricity Consumption

Actual usage of electricity at Swale House during 2023 is presented in Table 4 below. Actual overall consumption over 12 months was 209,897 kWh, with ~80% consistently at the daytime tariff and ~20% at night time tariff. Excluding standing charges, at the current day and night time tariffs (29.105 p/kWh and 24.843 p/kWh respectively) the value of electricity consumed would have been £59,284.

Table 4 – Swale House Actual Day and Night Consumption (kWh)

	Day (kWh)	Night (kWh)	Total (kWh)	% Day	% Night
Jan	16968	4433	21401	79.3%	20.7%
Feb	15200	3997	19198	79.2%	20.8%
Mar	16309	4094	20403	79.9%	20.1%
Apr	13678	3475	17153	79.7%	20.3%
May	13789	3549	17338	79.5%	20.5%
Jun	12928	3216	16144	80.1%	19.9%
Jul	12724	3224	15948	79.8%	20.2%
Aug	12084	3024	15108	80.0%	20.0%
Sep	12406	3011	15417	80.5%	19.5%
Oct	13423	3315	16738	80.2%	19.8%
Nov	14829	3519	18348	80.8%	19.2%
Dec	13177	3526	16704	78.9%	21.1%
Total	167515	42383	209897	79.8%	20.2%
Value	£48,755	£10,529	£59,284		

Figure 3 – Actual Electricity Consumption – Swale House



7. Savings (self-consumption) and Revenue (export to grid)

The savings / revenue attributable to the PV installation derives from displacement of mains imported electricity at the daytime tariff rate, plus any surplus over consumption that is exported to the grid. Self-consumption is calculated by matching the output of the PV array to the day-time electricity consumption for each month. This is presented in Table 5 below.

Table 5 – Estimated PV Self-Consumption and Self-Sufficiency – Swale House

	PV Output (kWh)	Day-time Consumption (kWh)	Self-consumption (kWh)	Self-consumption Rate	Self-sufficiency Rate
Jan	3112	16968	3112	100%	14.5%
Feb	5652	15200	5652	100%	29.4%
Mar	8171	16309	8171	100%	40.0%
Apr	14314	13678	13678	96%	79.7%
May	16133	13789	13789	85%	79.5%
Jun	17247	12928	12928	75%	80.1%
Jul	15053	12724	12724	85%	79.8%
Aug	14610	12084	12084	83%	80.0%
Sep	10634	12406	10634	100%	69.0%
Oct	7092	13423	7092	100%	42.4%
Nov	3420	14829	3420	100%	18.6%
Dec	1689	13177	1689	100%	10.1%
Total	117128	167515	104974	89.6%	50.0%

The overall self-consumption rate is estimated at 89.6%, i.e. of the total power generated by the PV array, we can expect 89.6% to be utilised on site at Swale House, displacing power that would otherwise need to be imported from the grid. At the prevailing day-time tariff rate of 29.105 p/kWh this would be expected to save £30,553 annually.

On this basis the PV array would achieve a self-sufficiency rate of 50.0%, i.e. we would expect the PV array to supply around 50% of the total electricity consumed by Swale House (209,897 kWh, day and night).

In addition, between April and August surplus PV generation (~12,153 kWh) would be exported back to the grid. At a day-time export tariff rate of 18 p/kWh (e.g. Octopus Flux) this could be worth an additional £2,153 pa. Therefore the estimated total benefit from the PV array would be in the region of £32,740 annually.

These annual savings will be recurring over the lifetime of the project. Solar panels will typically come with a manufacturer's performance warranty of 25 years.

8. Equipment and Installation Costs

The main items of equipment are 292 x PV panels, 6 x inverters, an export power manager, roof mounting equipment, ballast and electrical switchgear and sundries. At current wholesale prices from our distributor (Segen Ltd) the cost of this equipment would be around £47,000 (ex VAT). Note that this excludes any supplier margin on equipment.

Estimated design, installation and commissioning costs for an array of this capacity are likely to be in the region of £20,000 (ex VAT).

In practice suppliers will charge a margin over wholesale prices on equipment which could be more than 30%, depending upon how competitively the selected contractor is prepared to price for the project. Allowing for a 30% margin on the cost of equipment, the overall project cost could be in the region of £81,000 (ex VAT).

This does not include any project financing/opportunity costs or internal administration costs. It also does not include any costs for ongoing maintenance, albeit in practice these ought to be minimal (~£500 pa).

9. Financial Analysis

Based on savings (section 7) and costs (section 8), excluding any project financing costs, the simple undiscounted payback period is likely to be in the region of 2.5 years, depending upon the terms that can be negotiated with the preferred contractor.

Based on these projected costs and revenues the project achieves an Internal Rate of Return (IRR) of 38.91% after 10 years.

Increases in the cost of electricity which occur post installation will improve the rate of return on investment. Likewise a fall in the cost of electricity would reduce the rate of return.

Appendix 1 - Esdec Flat Fix Fusion

THE ADVANTAGES OF FLATFIX FUSION

FLEXIBLE AND EASY

- Completely modular system
- Flexible installation: Easy to build around obstacles
- Aesthetic lightweight system
- Single or dual setup
- Suitable for residential and commercial projects
- Strong and durable clamping force with metal insert in high and low base
- For panels up to 1150mm wide and 2190mm long

RELIABLE

- Aerodynamic design with rounded corners and smooth material finish
- Robust system thanks to connectors parallel and perpendicular to the panels
- Wind deflectors designed for maximum safety
- Tested to international standards
- 20-year warranty

SAFETY FOR THE ROOF

- For every type of roof
- Roof support with movable connectors
- Unique thermal decoupling prevents damage to roof material
- Optimum point pressure due to distributed ballast
- Integrated grounding and bonding in high and low base in accordance with IEC 60364 series
- Cable exits and cable guides (optional) for safe cable management

EASY TO INSTALL

- User-friendly click system
- Optimizer ready cable clip for easy attachment and safe cable removal
- Grounding clamp can easily be incorporated onto the end clamp
- Optimizer clip can also be used for most microinverters
- For the most common solar panels (angle of inclination 13°)
- Renewed end clamps for even more powerful and easier installation

FLATFIX FUSION

COMPLETE AND FLEXIBLE INSTALLATION ON EVERY ROOF

FlatFix Fusion is the modular and flexible mounting system for solar panels on small and medium-sized roofs. Its modular design enables a customized configuration to be created for every roof. Installers can, for example, easily build around obstacles – such as chimneys – with this system. FlatFix Fusion can be set up either in dual or single configuration. FlatFix Fusion is a 100% Dutch product that has proven itself for years. In 2021, the system received an update of a number of components, which not only makes installation even easier for the installer, but also further increases the safety of the roof and the PV system. It is now possible to install solar panels up to 1150mm wide and 2190mm long with FlatFix Fusion.

Easy to install

Esdec was founded by professional installers, the interest of the installer always come first when designing our products. Simplicity and flexibility were therefore the starting points in the design of our FlatFix Fusion system. Smart click connections enable the system to be assembled quickly. Handy features on the clamps and on the wind deflectors make installation even easier.

Safety for the roof

The different components are connected using fast-click connectors. The roof supports with movable connectors allow the system to move (expand and shrink) to prevent damages of the roof material. As a result, the thermal movements of the building are not transmitted to the PV system and vice versa. The 2021 upgrade includes a safe and aesthetic solution for cable management: cables are guided through the wind deflectors with a cable exit guide.

Reliability

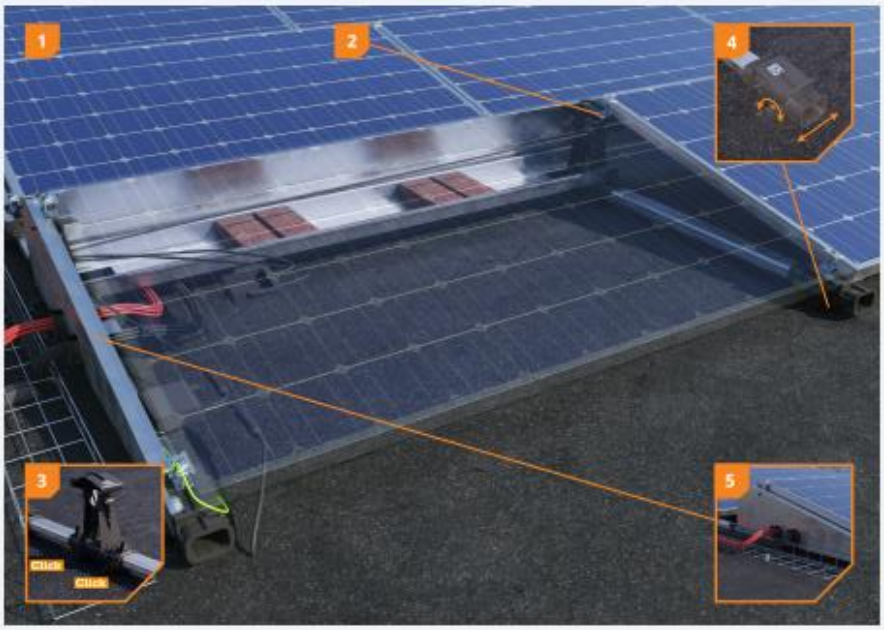
The patented FlatFix Fusion system has been extensively tested on fire safety, wind resistance and corrosion. With even stronger and durable clamping force with a metal insert in the high and low base. FlatFix Fusion is a high-quality mounting solution. It complies with the strictest international standards and comes with a 20-year warranty.

ADVANTAGES FOR THE INSTALLER

- Modular mounting solution with click connection
- Flexible installation on any roof
- Integrated grounding and equipotential bonding
- Ease of installation with optimizer clip with integrated cable clip

ADVANTAGES FOR THE END USER

- Roof-specific configuration
- Safe and reliable
- No damage of the roof material
- 20-year warranty



Strong, lightweight system

The different components enable flexible row lengths. This makes it possible to create a roof-specific setup and, for example, to build around obstacles.

Easy maintenance

FlatFix Fusion is made of strong, lightweight materials. With the high and low base, with a metal insert, the damping force remains optimal after removal and reinstallation of panels.

Unique click connection

The revolutionary, unique click connection makes the FlatFix Fusion a very quick and easy-to-install mounting solution.

With thermal decoupling

The roof supports with movable connectors give the system space to expand thermally without damaging the roof material.

With integrated cable management

The cables and plugs of the solar panels can be safely and easily attached to the mounting solution. With the cable exits in the wind deflectors and with the cable exit guides, cables can be stowed and guided in a safe way.

SYSTEM COMPONENTS

FlatFix Fusion roof support
1007012

FlatFix Fusion low base
1007022
1007022-S (with bonding)

FlatFix Fusion high base
1007031
1007031-S (with bonding)

FlatFix Fusion cable-clip optimizer ready***
1007041

FlatFix Fusion wind deflector rear*/**
1007201

FlatFix Fusion wind deflector left**
1007224 with baseprofile 940mm
1007226 with baseprofile 1030mm or 1077mm

FlatFix Fusion wind deflector right**
1007225 with baseprofile 940mm
1007227 with baseprofile 1030mm or 1077mm

FlatFix Fusion ballast container*/**
1007202

FlatFix Fusion stabilizer*/**
1007203

FlatFix Fusion base profile

210mm	1007121**
370mm	1007137**
550mm	1007155**
750mm	1007175**
940mm	1007194**
1030mm	1007195
1077mm	1007196

* Also available in 1200, 1500, 1600, 1700, 1900, 2000 & 2100
** Also available in black
*** Also suitable for most micro inverters

FASTENERS

Esdec mounting screw*/**

6 x 55mm	1000655
6 x 70mm	1000670
6 x 12mm	1000612

Esdec screw

6,0 x 25mm (self tapping)	1008085
6,3 x 32mm (self drilling)	1003015

* Depending on panel thickness and related end clamp
** Also available in black

CLAMPS

Flatfix Fusion universal module clamp with bonding**
1003022

FlatFix end clamp 30-50mm*/**
10043__
10044__ (black)

* Depending on panel thickness (in mm)
** Also available in black

ACCESSORIES

FlatFix Fusion grounding spring
1007502*

FlatFix Fusion grounding clamp (6mm²)
1007505

FlatFix Fusion grounding bracket
1007503

FlatFix Fusion TPO Mat
1007015

FlatFix Fusion roof support adapter
1007011

FlatFix Fusion low base extension
1007022-WP

FlatFix Fusion Cable exit guide
1005570

* Also available ready-assembled, see SYSTEM COMPONENTS

Calculator

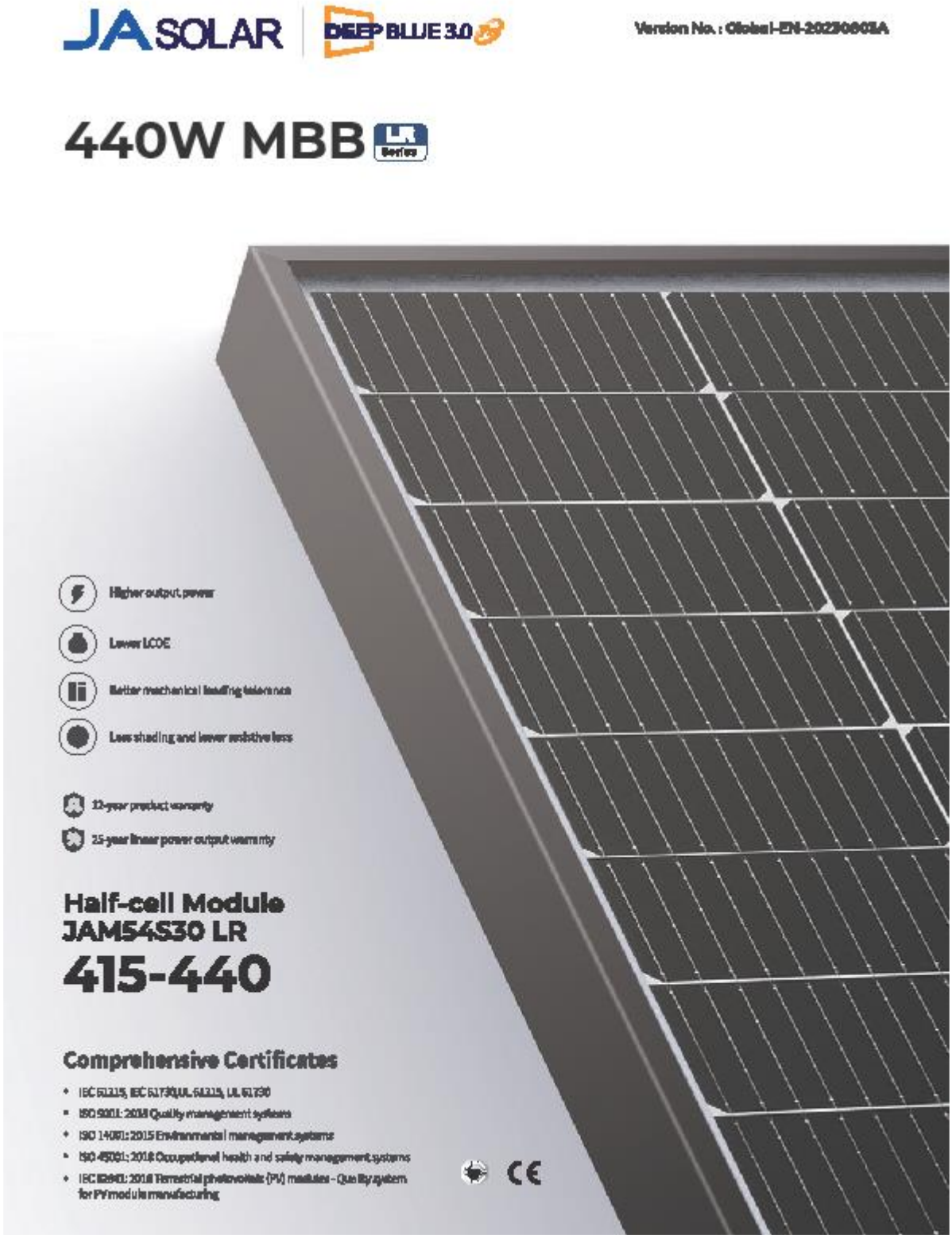
In the Esdec calculator you can manage and calculate all your projects, for both pitched and flat roofs. One platform with all Esdec mounting systems for the most reliable calculation of your project.

Go to **eu.esdec.com/en/calculator**

Warranty

- Use of premium materials
- Thoroughly tested
- 20-year warranty

Appendix 2 – PV Modules Datasheet



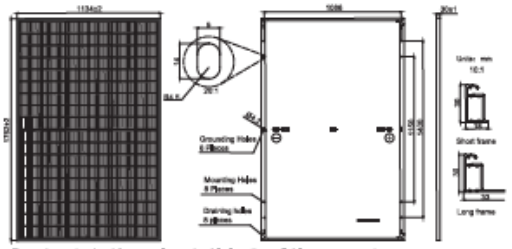
JA SOLAR | DEEP BLUE 3.0

www.jasolar.com
Specifications subject to technical changes and tests.
JA Solar reserves the right of final interpretation.

440W

415-440 LR Series

JAM54S30



Remark: customized frame color and cable length available upon request

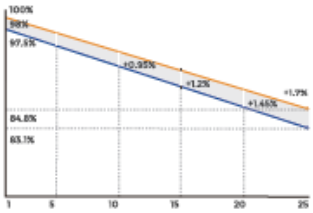
Cell	Mono
Weight	20kg
Dimensions	1762±2mm×1134±2mm×30±1mm
Cable Cross Section Size	4mm² (IEC), 12 AWG(UL)
No. of cells	108(6x18)
Junction Box	IP68, 3 diodes
Connector	QC 4.10-35I/ MC4-EVO2A
Cable Length (Including Connector)	Portrait: 300mm(+)/400mm(-); 800mm(+)/800mm(-)(Leapfrog) Landscape: 1200mm(+)/1200mm(-)
Front Glass	2.8mm
Packaging Configuration	36pcs/Pallet, 936pcs/40ft Container

ELECTRICAL PARAMETERS AT STC

TYPE	JAM54S30 -415/LR	JAM54S30 -420/LR	JAM54S30 -425/LR	JAM54S30 -430/LR	JAM54S30 -435/LR	JAM54S30 -440/LR
Rated Maximum Power(Pmax) [W]	415	420	425	430	435	440
Open Circuit Voltage(Voc) [V]	37.55	37.73	37.91	38.09	38.27	38.45
Maximum Power Voltage(Vmp) [V]	30.92	31.11	31.30	31.49	31.68	31.86
Short Circuit Current(Isc) [A]	14.17	14.25	14.33	14.42	14.50	14.58
Maximum Power Current(Imp) [A]	13.42	13.50	13.58	13.65	13.73	13.81
Module Efficiency [%]	20.8	21.0	21.3	21.5	21.8	22.0
Power Tolerance	0~+5W					
Temperature Coefficient of Isc(α_Isc)	+0.045%/℃					
Temperature Coefficient of Voc(β_Voc)	-0.275%/℃					
Temperature Coefficient of Pmax(γ_Pmp)	-0.350%/℃					
STC	Irradiance 1000W/m², cell temperature 25℃, AM1.5G					

Superior Warranty

0.55% Annual Degradation Over 25 years



- New linear power warranty
- Standard module linear power warranty

ELECTWRICAL PARAMETERS AT NOCT

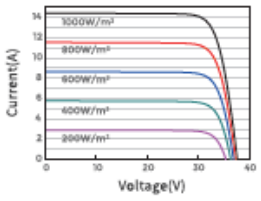
TYPE	JAM54S30 -415/LR	JAM54S30 -420/LR	JAM54S30 -425/LR	JAM54S30 -430/LR	JAM54S30 -435/LR	JAM54S30 -440/LR
Rated Max Power(Pmax) [W]	314	318	322	326	329	333
Open Circuit Voltage(Voc) [V]	35.53	35.70	35.87	36.04	36.21	36.38
Max Power Voltage(Vmp) [V]	29.26	29.44	29.62	29.80	29.98	30.15
Short Circuit Current(Isc) [A]	11.33	11.40	11.47	11.53	11.60	11.67
Max Power Current(Imp) [A]	10.74	10.80	10.86	10.92	10.99	11.05
NOCT	Irradiance 800W/m², ambient temperature 20℃, wind speed 1m/s, AM1.5G					

OPERATING CONDITIONS

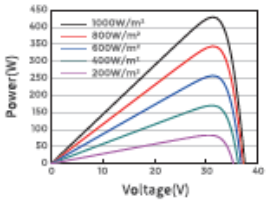
Maximum System Voltage	1000V/1500V DC
Operating Temperature	-40℃~+85℃
Maximum Series Fuse Rating	25A
Maximum Static Load,Front*	5400Pa(112lb/ft²)
Maximum Static Load,Back*	2400Pa(50lb/ft²)
NOCT	45±2℃
Safety Class	Class II
Fire Performance	UL Type 1

CHARACTERISTICS

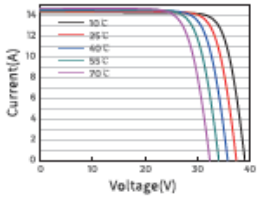
Current-Voltage Curve JAM54S30-430/LR



Power-Voltage Curve JAM54S30-430/LR



Current-Voltage Curve JAM54S30-430/LR



Appendix 3 - Solis 5G 3 phase Inverters Datasheet

solis

S5-GC(25-40)K

Solis Three Phase Inverters

360 degree

Model:

400V: S5-GC25K S5-GC30K S5-GC33K S5-GC36K S5-GC40K

Efficient

- Max. efficiency 98.7%
- String current up to **16A**
- 3/4 MPPT design, supports multiple orientation system design
- Night time PID recovery function, increases overall system yield (optional)
- Wide voltage range and low startup voltage

Safe

- IP66
- AFCI protection, proactively reduces fire risk
- Globally recognised branded componentry for longer life
- Intelligent redundant fan-cooling

Smart

- Supports export power control
- Intelligent string monitoring, smart I-V curve scan
- Supports RS485, WiFi, GPRS
- Scan to register on SolisCloud, supports remote upgrade and control

Economic

- Supports GPRS/WiFi communication with less wiring and reduced installation costs
- > 150% DC/AC ratio
- Supports high power modules for lower installation costs
- Supports aluminium wire access to reduce cost

Datasheet

Model Name	S5-GC25K	S5-GC30K	S5-GC33K	S5-GC36K	S5-GC40K
Input DC					
Recommended max. PV power	37.5 kW	45 kW	49.5 kW	54 kW	60 kW
Max. input voltage	1100 V				
Rated voltage	600 V				
Start-up voltage	180 V				
MPPT voltage range	200-1000 V				
Max. input current	32 A / 32 A / 32 A			4*32A	
Max. short circuit current	50 A / 50 A / 50 A			4*50A	
MPPT number/Max. input strings number	3/6			4/8	
Output AC					
Rated output power	25 kW	30 kW	33 kW	36 kW	40 kW
Max. apparent output power	27.5 kVA	33 kVA	36.3 kVA	39.6 kVA	44 kVA
Max. output power	27.5 kW	33 kW	36.3 kW	39.6 kW	44 kW
Rated grid voltage	3/N/PE, 220 V / 380 V, 230 V / 400 V				
Rated grid frequency	50 Hz / 60 Hz				
Rated grid output current	38.0 A / 36.1 A	45.6 A / 43.3 A	50.1 A / 47.6 A	54.7 A / 52.0 A	60.8 A / 57.7 A
Max. output current	41.8 A	50.2 A	55.1 A	60.2 A	66.9 A
Power Factor	>0.99 (0.8 leading - 0.8 lagging)				
THDi	<3%				
Efficiency					
Max. efficiency	98.5%		98.6%	98.7%	
EU efficiency	98.1%		98.2%	98.3%	
Protection					
DC reverse-polarity protection	Yes				
Short circuit protection	Yes				
Output over current protection	Yes				
Surge protection	DC Type II / AC Type II				
Grid monitoring	Yes				
Anti-islanding protection	Yes				
Temperature protection	Yes				
Strings monitoring	Yes				
I/V Curve scanning	Yes				
Integrated PID recovery	Optional				
Integrated AFCI (DC arc-fault circuit protection)	Yes [1]				
Integrated DC switch	Optional				
General Data					
Dimensions (W*H*D)	647*629*252 mm				
Weight	37 kg				
Topology	Transformerless				
Self consumption (night)	<1 W				
Operating ambient temperature range	-25 ~ +60°C				
Relative humidity	0-100%				
Ingress protection	IP66				
Cooling concept	Intelligent redundant fan-cooling				
Max. operation altitude	4000 m				
Grid connection standard	G98 or G99, VDE-AR-N 4105 / VDE V 0124, EN 50549-1, VDE 0126 / UTE C 15 / VFR:2019, RD 1699 / RD 244 / UNE 206006 / UNE 206007-1, CEI 0-21, C10/11, NRS 097-2-1, TOR, EIFS 2018.2, IEC 62116, IEC 61727, IEC60068, IEC 61683, EN 50530				
Safety/EMC standard	IEC/EN 62109-1/-2, IEC/EN 61000-6-1/-2/-3/-4				
Features					
DC connection	MC4 connector				
AC connection	OT terminal				
Display	LCD				
Communication	RS485, Optional: Wi-Fi, GPRS				

[1] Activation required.

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Environment and Climate Change Meeting	
Meeting Date	3 October 2024
Report Title	Swale Waste and Street Cleansing Scrutiny Review – deferral request
EMT Lead	Emma Wiggins, Director of Regeneration and Neighbourhoods
Head of Service	Martyn Cassell, Head of Environment and Leisure
Lead Officer	Janet Dart, Policy & Engagement Officer
Classification	**Open**
Recommendations	1. To agree that the Waste & Street Cleansing Scrutiny Review report timelines are extended and the report is presented and discussed at the Environment & Climate Change Committee Meeting on 15 January 2025 instead of 20 November 2024.

1 Purpose of Report and Executive Summary

1.1 This report gives a short update on the progress of the Waste Scrutiny Panel and asks the Environment & Climate Change Committee to agree to moving the presentation and discussion of the Waste & Street Cleansing Scrutiny Review Report from 20 November 2024 to 15 January 2025.

2 Background

2.1 It was proposed at the Environment & Climate Change meeting on 16 July 2024 that a formal Scrutiny Panel be formed to undertake a scrutiny review, reporting back to an Extraordinary Environment & Climate Change Committee meeting on 20 November 2024.

2.2 The panel is made up of the following Members:

- Cllr Rich Lehmann (Chair)
- Cllr Chris Palmer
- Cllr Hannah Perkin
- Cllr Julien Speed
- Cllr Dolley Wooster

2.3 The panel have met 4 times, an initial scoping meeting, followed by workshops looking in detail at themes on resources and staff, data and rounds, and contracts and project management. As part of those meetings the panel have been provided with a large amount of data and information. The panel have further themes they will be investigating in the coming weeks on communications and a direct session with the contractor.

2.4 A public survey on the waste service is ongoing and at the time of writing this report there had been 1,917 responses.

2.5 When the panel met on 25 September 2024, they felt that to effectively carry out the scrutiny review and to analyse all the data, information and responses to the survey, they would like more time to come to conclusions and make recommendations.

2.6 The Panel realise that the residents are keen to hear the outcome of the scrutiny review but are of the opinion it should not be rushed so that all issues are carefully considered. Furthermore, Members of the Panel noted that regular changes are being made, so a delay in delivering the report will not delay service improvements.

3 Proposals

3.1 To agree that the Waste & Street Cleansing Scrutiny Review report timelines are extended and that the report is presented and discussed at the Environment & Climate Change Committee Meeting on 15 January 2025 instead of 20 November 2024

4 Alternative Options Considered and Rejected

4.1 To complete the scrutiny review in time for the Extraordinary Environment & Climate Change Committee on 20 November 2024. This is not recommended as the panel feel that they will not have time to carry out their investigations and analyse all feedback and data in a way that will produce satisfactory conclusions and recommendations.

5 Consultation Undertaken or Proposed

5.1 No consultation has been taken on the decision to move the date of presenting the Waste & Street Cleansing Scrutiny Review Report from 20 November 2024 to 15 January 2025 other than bringing it to this evening's meeting for discussion with Committee members.

6 Implications

Issue	**Implications**
Corporate Plan	**Environment** – to provide a cleaner, healthier, more sustainable and enjoyable environment, and to prepare our borough for the challenges ahead.

Financial, Resource and Property	There are no financial implications in holding a Scrutiny Review, however considerable officer resources will be required to support and feed into the review.
Legal, Statutory and Procurement	The review may wish to scrutinise the procurement process which was completed in line with our Commissioning and Procurement Strategy and national legislation. The Panel may wish to look at the service Contract.
Crime and Disorder	Despite an understandable frustration from residents who have received disrupted collections, physical and verbal abuse to staff at SBC and contractor has been unacceptable.
Environment and Climate/Ecological Emergency	One of the key benefits of the contract and a strategic objective agreed at the start of the tender process was the environmental gains we will make on the service's carbon footprint.
Health and Wellbeing	The delivery of a successful waste contract is imperative for public health reasons. It is acknowledged that through the mobilisation period there have been instances of vermin, detritus in the streets which is not good for public health and wellbeing.
Safeguarding of Children, Young People and Vulnerable Adults	Some residents require additional services such as clinical and assisted collections. The Panel may wish to focus on whether the disruption impacted those residents.
Risk Management and Health and Safety	Major contract failure risk is one of our corporate risks and has clear mitigating actions set against it. This action has been reviewed throughout the mobilisation period and reported to Audit committee.
Equality and Diversity	The disruption will have impacted some of our more vulnerable residents – assisted and clinical collections
Privacy and Data Protection	n/a

7 Appendices

7.1 None.

8 Background Papers

None.

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Forward Decisions Plan: Environment and Climate Change Committee 2024 – 25 (October 2024 meeting)

Report title, background information and recommendation(s)	Date of meeting	Open or exempt	Lead Officer and report author
Climate and Ecological Emergency Annual Report DRAFT	20 November 2024	Open	Head of Service: Martyn Cassell Report Author: Janet Hill
Waste and Street Cleansing – a review of new service implementation	20 November 2024	Open	Head of Service: Martyn Cassell Report Author: Alister Andrews
Paperless Reports	January 2025	Open	Head of Service: Martyn Cassell Report Author: Samuel Brookfield
BBQs in public places – monitoring	January 2025	Open	Head of Service: Martyn Cassell Report Author: Graeme Tuff
Climate and Ecological Emergency Action Plan	January 2025/March 2025	Open	Head of Service: Martyn Cassell Report Author: Janet Hill
Open Spaces and Play Strategy	January 2025/March 2025	Open	Head of Service: Martyn Cassell Report Author:
Litter Enforcement Contract	January 2025/March 2025	Open	Head of Service: Martyn Cassell Report Author:

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