



Pippa Auger &lt;deputy.clerk@haslemeretc.org&gt;

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**CIL funding for Haslewey Solar Panels**

3 messages

Thu, Jun 15, 2023 at 11:22 AM

To: deputy.clerk@haslemeretc.org

Dear Pippa,

I hope you're well. I'm writing to you in my capacity as [REDACTED] in regard of the CIL funding the town council agreed for Haslewey's solar panel project.

Having reviewed the quotes we received and followed up on them the trustees have decided to go ahead with the project with Raven Renewables. I enclose a copy of their final proposal and a short note on our decision for your attention, as well as a copy of an alternative quote we didn't pursue. I also enclose a copy of the permission to proceed from our landlord, Waverly borough council.

I hope this meet as your requirements, but please let me know if there is anything else you need. I'd be happy to answer any questions or update the note as required.

Payment for the project is staged, as is shown in the proposal, with the first payment payable when the contract is signed. This was for £14,968 and I can confirm that Haslewey has made this payment. Could I ask you to reimburse us for 65% of this amount in line with the CIL funding granted? I calculate that this is equal to £9,729.20. Haslewey's bank details are:

Sort code: [REDACTED]

Acc no: [REDACTED]

Our official name is: Haslemere and District Community Centre.






Looking to the future, the final payment is quite large and might present us with some cashflow challenges. When the time comes, would it be possible for the council to pay us before we make the final transfer rather than reimburse us afterwards?

Many thanks,

[REDACTED]

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**5 attachments**

-  **Solar PV Quotation 20% VAT - Ken Griffiths (Haslewey Community Centre) - 5.4.23.pdf**  
401K
-  **20% VAT Haslewey Community Centre, Lion Green, Haslemere GU27 1LD Easy PV Project Report (1).pdf**  
1134K
-  **23.05.30 - Consent letter signed by WBC.pdf**  
1125K
-  **Vision 2030 quotation.pdf**  
126K
-  **Summary of Haslewey Solar Panel project for Haslemere Town Council.docx**  
15K

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**Pippa Auger** <deputy.clerk@haslemeretc.org>

Wed, Jun 21, 2023 at 1:13 PM

To: [REDACTED]

Hi [REDACTED]

Thank you for your email. I'm well thank you and hope you are too.

I'm just back from holiday and am playing significant catch up.

I'll take a look at your email tomorrow but it may be that it needs to go back to the CIL committee in July. I'll get back to you as soon as I can.

Kind regards

Pippa

**Pippa Auger**

**Deputy Town Clerk**

Haslemere Town Council

Please note my working days are Monday, Wednesday, Thursday and Friday

Office opening hours Monday, Wednesday & Friday 10am-3pm

Telephone: 01428 658828

Visit our website [www.haslemeretc.org](http://www.haslemeretc.org)

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**Mayor 2023-2024:** Cllr Jerome Davidson

**Deputy Mayor 2023-2024:** Cllr Claire Matthes

**Mayor's Charities:** Crossways Counselling Services and Royal British Legion

To report issues which are the responsibility of other councils, please use the following contact numbers.

**Surrey County Council (roads including potholes, paths, streetlight, schools etc)**

03456 009 009

0300 200 1003 (emergencies – out of hours)

**Waverley Borough Council (Household and garden waste collections and recycling, council housing, leisure centres, off street parking / car parks etc)**

01483 523333

01483 523200 (emergencies – out of hours)

[Quoted text hidden]

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**[REDACTED]**  
To: Pippa Auger <deputy.clerk@haslemeretc.org>

Wed, Jun 21, 2023 at 2:06 PM

Thanks Pippa,

Hope you had a good holiday!

All the best,



Sent from my iPhone

On 21 Jun 2023, at 14:13, Pippa Auger <[deputy.clerk@haslemeretc.org](mailto:deputy.clerk@haslemeretc.org)> wrote:

[Quoted text hidden]

# Summary of Haslewey Solar Panel project for Haslemere Town Council

13 June 2023

## Introduction

The Haslemere & District Community Centre (“Haslewey”) has been exploring the installation of solar panels. As part of this process Haslewey applied to Haslemere Town Council (“HTC”) for part-funding through CIL. You informed us on 6<sup>th</sup> March that HTC had agreed to provide CIL funding of 65% of the project cost, up to a maximum of £39,000.

Haslewey have now decided upon a provider and obtained the landlord’s permission for the project (which was outstanding at the time of the CIL applications). This note is intended to provide the information required to allow HTC to provide the CIL funding as agreed.

## Solar Panel quotations

Only two potential installers responded positively to Haslewey’s request for quotation. These were Vision 2030 and Raven Renewables. Both of their proposals are attached.

Raven Renewables quoted a price of £59,874 inc VAT. Vision 2030 initially quoted a price of £32,400, significantly lower than the Raven Renewables quotation. However, the two quotations were not on a like for like basis, and the Vision 2030 quotation omitted a number of items we required, namely batteries and an immersion heater (which significantly improve the efficiency), scaffolding and a host of smaller items. On a like for like basis we calculate that the Vision 2030 quotation would have been £54,472 inc VAT.

Despite being some £5,000 more expensive, the trustees decided to accept the Raven Renewables proposal. This is because we have been impressed with their responsiveness and attention to detail, which we consider important in a project of this size, and because their charitable business model is well aligned with ours.

## Landlord’s permission

In the trustees’ view the solar panel installation can be carried out under permitted development and so planning permission is not required. However, Haslewey does require permission for the project from Waverley borough council as our landlord. At the time of our CIL application this had not been received, but we are pleased to confirm that it has now been granted – a copy of the permission is attached.

## Funding

We had funding of £15,000 in place for the project before we applied for CIL. At 65% of cost the CIL funding will provide a further £38,918, giving a total of £53,918. We intend to fund the remaining £5,956 from a combination of reserves and general fundraising.

## Solar PV Quotation

[Redacted]

<b>Customer Name:</b>	[Redacted] (Haslewey Community Centre)	<b>Project Reference:</b>	GU27 1LD
<b>Installation Address:</b>	Lion Green, Haslemere GU27 1LD		
<b>Quotation issued by:</b>	[Redacted]	<b>Date issued:</b>	05/04/2023

Solar PV Quotation

Description of Goods	Qty.	Unit Price	Total Price
Longi All Black 400W Mono Panels	62	£189	£11,688
SolaX Solax X3-PRO 3 Phase Inverter 8.0kW inverter String inverter(s)	1	£1,238	£1,238
Optimisers	0	£0	£0
On-roof Renusol VS Mounting System	1	£2,296	£2,296
Solar PV cabling	2	£413	£826
Galvanised Bird Mesh Kit	7	£330	£2,312
Hot water immersion element & timer	1	£1,651	£1,651
SolaX 3 phase 15kW DC 11.6kWh Battery	1	£8,029	£8,029
Other Kit	1	£435	£435
Commissioning costs	1	£2,270	£2,270
Scaffolding & access	1	£4,586	£4,586
Export meter/CT clamp (for consumption monitoring)	1	£76	£76
<b>Goods Total</b>			<b>£35,406</b>
Description of Goods	Qty.	Unit Price	Total Price
Roofer installation of solar panels			£ 11,517
Electrician installation of solar panels and associated electrical equipment			£ 2,972
<b>Services Total:</b>			<b>£14,489</b>
<b>Goods &amp; Services Sub Total:</b>			<b>£49,895</b>
<b>VAT:</b>			<b>£9,979</b>
<b>Total:</b>			<b>£59,874</b>
<p>Our intention is to give you a full and clear cost for the installation of the system. Providing nothing unforeseen should occur the only additional costs would be those associated with the Energy Performance Certificate (if not included above) and any planning related issues should they be required.</p>			

### Solar PV Quotation

Description	Included/ Excluded
<b>Extras</b>	
Hot water immersion element & timer	✓
Bird mesh	✓
Optimisers	✗
Export meter/CT (for consumption monitoring)	✓
Scaffolding & access	✓
Panel by panel monitoring	✗
<b>Battery</b>	
SolaX 3 phase 15kW DC 11.6kWh	✓
<b>Other Kit</b>	
AC Isolators	✓
DC Isolators	✓
MC4s	✓
Solar PV DC & AC cabling	✓
MCS Labels	✓
Delivery	✓
Generation meter	✓
<b>Other Services</b>	
MCS Certificate	✓
Commissioning	✓
EPC	✗
Grid application	✓
On site storage & access equipment	✗

Solar PV Quotation

Guarantees and Warranties		
Workmanship Warranty	2	Years
Solar Panels – Product Warranty	10	Years
Solar Panels – Performance Warranty	25	Years
Inverter Warranty	5	Years
Renusol Mounting System Warranty	10	Years

Your equipment is guaranteed by its manufacturer, but you should contact us in the first instance if anything appears to be operating incorrectly.

In addition to the product guarantees, our work will be covered by a workmanship warranty. This workmanship warranty will be transferable to the new legal owner of the property if it is sold during the warranty period.

As members of RECC we are required to ensure that should we cease trading, due to receivership, administration or bankruptcy, that the workmanship warranty that we have in place for your installation will still be honoured.

When you confirm the order and we have received any requested deposit, we will register your name, address and the total value of the contract with the Independent Warranty Assurance scheme (IWA). A leaflet explaining the scheme is enclosed. If you are not content for us to register your details in this way, please let us know. The insurance provider will send the policy documents direct to you. This policy will be at no additional cost to you.

Should we cause any damage, either to installed equipment or to your property we will rectify such damage without charge to you.

Payment Terms	
<b>Deposit:</b> Deposit (Maximum 25% of the total sum inc VAT) payable on confirmation of order	£14,968.50
<b>Advance Payment:</b> Further advance payment payable on (no more than 3 weeks before delivery date. Deposit and advance payments together will not exceed 60% of the total sum inc VAT)	£14,968.50
<b>Balance:</b> Balance payable following final commissioning	£29,937.00

**It is important that this quotation is read in conjunction with the full performance estimate that accompanies it. If you require clarification on any point please do not hesitate to contact us**



## Solar PV Quotation

**Customer Confirmation**

We/I agree to the Quotation and confirm the order for the products and installation services specified.

We/I agree to the total cost and payment terms set out above.

We/I have read and agree to abide by the Terms and Conditions of the Contract provided with this Quotation.

By signing this form, you are also confirming that you have received Planning Permission or a Building Warrant for the proposed installation or ascertained that these are not required. We cannot be held responsible for any installations where Planning Permission or a Building Warrant was required but not obtained, and no refunds will be offered.

**We can accept payment by Bank Transfer only. We do not currently accept payment over the phone or via credit card**

Name:	
Signature:	
Date:	

**All information can be supplied in a large text if required**

**Please make payable to Raven Repairs Ltd, quoting your name as the account reference**

**BACS payments to:**

**Sort code:** [REDACTED]

**Account number:** [REDACTED]

**Account name: Raven Repairs Ltd**

**Quotation valid for 30 days**

## Solar PV Quotation

### **Important notes concerning this quotation**

#### **Costing**

This quotation has been based on us being able to install your system as described without interruption. Should there be circumstances beyond our control which cause an interruption to the installation process we will discuss with you the implications of such a delay.

Should you decide to make any changes to the agreed installation within your cancellation period, we will produce another full quotation which takes into account these changes. You will be given a further cancellation period to consider this quotation.

Should you wish to make any changes to the agreed installation after your cancellation period has expired, again we will prepare a new quotation for you, but we reserve the right to charge for any reasonable costs we have incurred in working towards the original installation details.

If, during the installation process, we come across any situation that we could not reasonably be expected to foresee, for example, remedial electrical or building work, we will discuss with you the implications and costs involved in rectifying the problem.

Should you request any changes after the installation process has begun that involve additional cost we will provide you with a quotation based on the daily or hourly rate of our installers. The rate that would apply would be £50 per hour or £ 350 per day.

#### **Registering for Smart Export Guarantee (SEG)**

The smart export guarantee (SEG) is an obligation set by the government for licensed electricity suppliers to offer a tariff and make payment to small-scale low-carbon generators for electricity exported to the National Grid, providing certain criteria are met.

The SEG is an opportunity for anyone who has installed Solar PV up to a capacity of 5MW.

The SEG Licensee is required to put processes in place to pay for the electricity exported by the eligible installation and to report to Ofgem on installations under the SEG arrangements. SEG Licensees determine the rate they will pay, contract length and other terms.

However, whilst wholesale electricity prices can sometimes fall below zero, SEG Licensees must always offer a tariff that remains above zero. SEG payments must be calculated by SEG Licensees using Export Meter Readings.

We will register your installation on the MCS Installation database and send you the MCS Certificate. You must send your MCS certificate to your chosen licensed electricity supplier in order to receive SEG payments.

#### **Cancellation Rights**

Your cancellation rights will vary depending on whether the contract you agree with us is considered to have been agreed on

## Solar PV Quotation

For contracts considered to have been agreed on trade premises you will be given a fourteen day cancellation period from the day that the contract was signed.

For contracts considered to have been agreed away from trade premises, your cancellation rights are as set out in the Consumer Contracts (Information, Cancellation and Additional Charges) Regulations. These regulations give you the right to cancel from the time that the contract is signed until fourteen days after the delivery of the last of the goods.

If you wish us to begin work within the cancellation period you must give us express permission, in writing, to do so.

You can find full details of your cancellation rights within the contract we will ask you to sign and also on the Cancellation Form we will issue to you.

### Contract Terms

We have enclosed a copy of our contract with this quotation. Please read this carefully, and as always, please contact us if you require further clarification.

### Timetable for works

If you decide to accept our quotation, we will contact you and arrange a mutually agreeable date to begin the installation. We will confirm this with you in writing.

It usually takes us 31 - 32 days to carry out an installation.

Your installation will usually take place within **6 weeks** of receiving your order, subject to workload and availability of materials. We will contact you at the earliest opportunity should there be any delay in obtaining the goods or services required.

### Planning permission

If your property is a listed building or you are in a conservation area you may need planning permission. We will assist you in gaining any permission but you are responsible for contacting your local planning authority to obtain confirmation that planning permission is not required.

We cannot be held responsible for any installations carried out where planning permission was required but not obtained. No refunds will be given in such cases.

Requirements regarding planning permission can vary from area to area.

By signing the contract, you are confirming that you have received Planning Permission or a Building Warrant for the proposed installation, or ascertained that these are not required. We cannot be held responsible for any installations where Planning Permission or a Building Warrant was required but not obtained, and no refunds will be offered.

By signing and returning the Order Form, you are confirming the order for the products and installation services specified on this Quotation. This order will become binding when we notify you of its acceptance and will be governed by our installation terms and conditions.

## Solar PV Quotation

We are a member of the RECC and this document is prepared in accordance with its Consumer Code, a copy of which is available on request.

### **Deposits and advance payments**

We will never ask for more than a 25% deposit, including VAT, on signing of the contract. If we require you to make any advance payments, these will be communicated to you, in writing, with the dates that they are due to us. These advance payments will never, when added to the deposit, exceed 60% of the total agreed contracted price. We will not ask for any advance payments more than 21 days from the agreed delivery or installation date.

Your deposit and any further advance payments requested will be insured with IWA under their Independent Warranty Assurance scheme so that you can get the work completed or your money back if we cannot deliver your equipment because we have gone out of business.

When you confirm the order and we receive any requested deposit, we will register your name, address and the total value of the contract with IWA. You will be sent your insurance policy documents directly from IWA. A leaflet explaining the scheme is enclosed. If you are not content for us to register your details in this way, please let us know.

### **Agreed payments are valid for 30 days from the day you received the quotation**

### **Metering**

You'll need to have a smart meter or a meter capable of reporting exports on a half-hourly basis.

### **Insurance**

It is recommended that you inform your property insurers about the proposed installation to check if it will increase your buildings insurance premium.

As members of the Renewable Energy Consumer Code, we must have appropriate insurance to cover possible third-party damage, which may be caused by any of our activities. We are insured by **Aviva**.

### **Data protection**

We will keep information about individuals in accordance with data protection legislation. We will not pass information to any third party without your permission. Information about you may be passed to the Renewable Energy Consumer Code administrator and its auditors as part of the Code administrators monitoring of their compliance with the Code. The Code administrator may contact you directly.

### **Commissioning the system**

The installation will be commissioned according to MCS installation standards to ensure that the system is safe, has been installed in accordance with documented procedures and manufacturer's requirements and is operating correctly in accordance with the system design.

## Solar PV Quotation

Following the testing and commissioning of the system, we will give you a Handover Certificate. This certificate confirms that we have met the requirements of the MCS and it details key information about the installation.

We will also, at this time, provide to you a Handover Pack containing information about the installed equipment and system performance.

We will also explain the operation and maintenance requirements of the system.

A detailed operating manual will be provided to you within 7 days.

We will register the installation on the MCS Installation Database (MID) and will provide to you, within 10 working days, the MCS Certificate. This certificate should be retained in your Handover Pack.

### **After sales support and maintenance**

If, following installation, the system does not appear to be operating correctly please refer to the operating instructions. We will explain to you, at the handover stage, the safe operation of the system.

If you are still in doubt as to any aspect of the systems operation, please contact us.

We will issue to you at handover information as to any maintenance requirements.

We can, should you require it, provide servicing and/or maintenance contracts at additional cost.

### **RECC and the Renewable Energy Consumer Code**

We are a member of RECC, membership number 00072358 and this document is prepared in accordance with the Renewable Energy Consumer Code.

A leaflet describing the Renewable Energy Consumer Code is enclosed with this quotation. The Code can be viewed in full at [www.recc.org.uk/scheme/consumer-code](http://www.recc.org.uk/scheme/consumer-code)

### **Complaints**

We hope you won't have any reason to complain about any aspect of our service. But if you do, please contact us.

You may contact us by telephone, letter or e mail, and you will find our contact details on this quotation. We will acknowledge and attempt to resolve your complaint promptly. Where we need to investigate the complaint, we will report to you our progress on any investigation within seven working days.

If we are unable resolve your complaint, you may be able to complain to RECC. You can read about this here: <http://www.recc.org.uk/consumers/how-to-complain>.

## Solar PV Quotation

### **If you wish to accept the quotation**

If you wish to accept the quotation, please read the Contract carefully. If you are in agreement with our terms and conditions, please complete the Customer Confirmation and return it to us together with the signed Contract and your deposit payment if we have requested one. We will then contact you to arrange the date for the installation.

If you have any questions on any aspect of this quotation, the contract or any other related issue please do not hesitate to contact us.

## Contract of Sale – for contracts agreed away from trade premises

**Should you require either this Contract or any other information we have supplied to you in large print, please contact us.**

This Contract has been prepared to comply with all our obligations under the Renewable Energy Consumer Code (RECC) and the Microgeneration Certification Scheme (MCS).

This contract details our obligations to you, and your obligations to us, if there is any point that we can clarify for you, please contact us.

Our main obligation to you is to do the work with all reasonable skill and care according to the standards set by the Microgeneration Certification Scheme (MCS) and according to the timetable set out in the Quote. Under the MCS, only certified companies can enter into a contract with a customer for the sale and installation of a system. **Our MCS Certification number is: NIC600197**

### 1. The Quotation

The quotation we have given you (**provided separately**) is valid for 30 days from the date of issue. To confirm your order, you will need to sign both copies of this contract; you should keep one copy for your records and return the other copy to us at the address on the quotation. No contract will be in place until we confirm the order with you.

Please read these terms carefully before signing them. If you need any explanations about them, please contact us using the address or telephone number provided.

The quotation will document all goods and services we propose to supply, along with the total price for these goods and services including VAT.

We will provide you with a timetable for supplying the goods and carrying out the installation.

The quotation will include information as to the performance of the technology we have proposed to install. These performance estimates will be calculated according to the requirements of the appropriate MCS Standard.

We will discuss with you and provide you with information as to the location of key components. You will be given the opportunity to approve the site designs before work commences.

Where we are unable to supply the main energy generator that was specified in the quotation, we will inform you of this in writing and you will have the right to cancel this contract.

We will advise you on approvals and permissions that may be required for the work; however, it will be your responsibility to ensure that such approvals and permissions are in place. If we require evidence of those permissions (and related drawings and/or specifications) you must make those available.

### **Additional Payments**

If there are additional payments that you may have to make, such as planning costs or if you need to consult a Structural Engineer, we will offer assistance and advice, but you will be responsible for these costs.

## Contract of Sale – for contracts agreed away from trade premises

If there is a particular service or item of equipment that would normally be considered as part of the installation and you have requested that this not be included, then we will have documented this on the quotation.

Please take time to acquaint yourself with this contract, if there is anything you do not understand, or if you require clarification on any point, please contact us.

### **2. Right to cancel**

#### **Your rights under this contract**

You have the right to cancel this contract during the 'cancellation period' without giving any reason.

**The cancellation period lasts 14 days and will start on the day the last part of the goods relating to the contract is delivered to you. You can also cancel the contract without penalty before any of the goods are delivered.**

To exercise the right to cancel, you must inform us of your decision to cancel this contract by a clear statement (e.g. a letter sent by post, fax or e-mail). You may use the Cancellation Form we have supplied but it is not obligatory.

To meet the cancellation deadline, it is sufficient for you to send your communication concerning your exercise of the right to cancel before the cancellation period has expired.

You may also cancel this contract if there is an unreasonable delay in the installation being carried out, if this has not been caused by you. You would also be entitled to a full refund if that delay has been caused by something outside of our direct control but not caused by you.

If you cancel this contract outside the cancellation period you may have to pay to us reasonable costs for any losses we may have incurred. We will attempt to keep these costs to a minimum. If you have paid us a deposit or any advance payments we may retain all or part of these payments as a contribution.

You will be entitled to cancel this contract if there is a serious delay in our ability to carry out the agreed work that is outside of your control, but within our control. You will be entitled to a full refund.

If the final design or the main Energy Generator differs from what is outlined in the quotation, you are entitled to cancel the contract.

If we are in serious breach of our obligations as detailed in this contract then you will be entitled to cancel this contract, request a repair or replacement or you may be entitled to request compensation.

### **3. Effects of cancellation**

If you cancel this contract, we will reimburse to you all payments received, including the costs of delivery (except for the supplementary costs arising if you chose a type of delivery other than the least expensive type of standard delivery offered by us).

We may make a deduction from the reimbursement for loss in value of any goods supplied, if the loss is a result of unnecessary handling by you.



## Contract of Sale – for contracts agreed away from trade premises

We will make the reimbursement without undue delay, and not later than:

- a) 14 days after the day we receive back from you any goods supplied, or
- b) (if earlier) 14 days after the day you provide evidence that you have returned the goods, or
- c) If there were no goods supplied, 14 days after the day on which we are informed about your decision to cancel this contract.

We will make the reimbursement using the same means of payment as you used for the initial transaction, unless you have expressly agreed otherwise; in any event, you will not incur any fees as a result of the reimbursement.

We will collect the goods at our expense. You are only liable for any diminished value of the goods resulting from the handling other than what is necessary to establish the nature, characteristics and functioning of the goods.

### **4. Work begun prior to the expiry of the cancellation period**

If you have agreed in writing that installation work will commence before the cancellation period expires, and you subsequently cancel in accordance with your rights, you are advised that reasonable payment may be due for any work carried out. You must confirm in writing that work may commence before your cancellation period expires.

You will be entitled to cancel this contract if there is a serious delay in our ability to carry out the agreed work that is outside of your control, but within our control. You will be entitled to a full refund.

If we are in serious breach of our obligations as detailed in this contract then you will be entitled to cancel this contract, request a repair or replacement or you may be entitled to request compensation.

You can only recourse to these actions if the goods or services are incorrectly described or not fit for purpose. You will not be entitled to seek these remedies if you have changed your mind about the goods and services agreed to outside of any required cancellation periods.

### **5. Related credit and other agreements**

If you decide to cancel your contract for our goods and services, then any credit agreement and any other ancillary contracts related to the main contract will be automatically cancelled.

### **6. Our rights under this contract**

If, within fourteen days of us informing you in writing of a serious breach of your obligations to us you have failed to rectify this breach, we will have the right to cancel this contract.

Should we suffer any losses due to a breach of this contract then we will be entitled to reasonable compensation to cover these losses. We are required to attempt to keep all losses to a minimum.

### **7. Timetable for works**

We will have agreed with you a timetable for carrying out the installation. By signing this contract, you are confirming that you agree with this timetable.

## Contract of Sale – for contracts agreed away from trade premises

There can be occasions that this timetable may need to be varied, due to, for example, poor weather or unavailability of goods and services. We will inform you of any delay we become aware of at the earliest possible opportunity. We would then arrange a new mutually agreeable timetable.

In the case of severe delays to the delivery of goods then you may be offered different products of equivalent specification, value and quality, so long as they are MCS certified. You can either accept that offer, wait for the products you ordered or choose to cancel the contract without penalty.

Should the delay be caused by us, or by our suppliers, and that delay could be considered as severe by a reasonable person, you would be entitled to cancel this contract without penalty to you.

Should the delay be caused by you, we will attempt to accommodate that delay without cost to you. However, if the delay incurs us in extra costs, for example scaffolding, we will require that you cover these costs.

### **8. The Installation**

The installation will be carried out strictly in line with the MIS Standard relevant to the technology, and to any document referred to within that standard. In addition, we will ensure at all times that we meet all our obligations under the RECC Consumer Code.

The goods we supply will be of satisfactory quality and fit for the purpose. They will operate as we have described to you. We will have insurances in place which will cover any loss or damage caused by us or our agents.

You will be required to supply to us normal services free of charge; this would include toilet, washing, water facilities and electricity. You should also ensure we have safe and easy access to the installation area.

Any work to prepare for the installation, carried out by you or a third party that you employ should be carried out in line with the agreed start date for the installation. If this work has not been completed and a consequent delay is caused you may be liable for any costs incurred by us for such a delay.

The work will be carried out by personnel trained in each of the tasks they are assigned.

You will be given warranties for both the installation itself and for the installed goods. The terms of these warranties will be given to you in writing and we will explain them to you verbally.

Within seven days of the completion of the installation we will hand over to you all documentation required as set out within the appropriate Microgeneration Installation Standard.

### **9. Deposits, advance payments and goods purchased with deposits and advance payments**

Any deposits and advance payments that you make to us can only be used to carry out work under this contract.

We are required under the Renewable Energy Consumer Code to protect any deposits and advance payments you make to us, as well as the Workmanship Warranty, with an insurance policy. We will give to you the name and contact details of this insurance company with the quotation. You will be entitled to claim on this policy should we fall into receivership, bankruptcy or administration.

## Contract of Sale – for contracts agreed away from trade premises

When we purchase goods for use under this contract the legal title to those goods or the proportion of which you have paid us for will pass to you. We will either deliver them to you or we will store them for you and mark them as your property. They will be kept separate from other goods. We will ensure that these goods are insured until they are delivered to you. You may make arrangements to inspect the goods or to remove them from our premises if you wish.

If we have requested a deposit, then this deposit will not exceed 25% of the total contract price set out in the quotation. Should you decide to cancel this contract within the cancellation period, then this deposit will be returned to you promptly.

If we have requested advance payments in addition to a deposit, the total of all advance payments and deposits will not exceed 60% of the total contract price.

We will not request advance payments to be made any more than 3 weeks from the agreed delivery or installation date.

If we have requested a deposit before a full technical assessment of your property has been made, and we are unable to proceed because of something discovered during that technical inspection, then any deposits or advance payments will be returned.

The quotation will set out in detail when invoices will be sent and the amounts due for each payment.

### **10. Goods belonging to us**

Any goods belonging to us that have been delivered to you should remain clearly identifiable as our property. Until the title to the goods is transferred to you the goods should be stored in such a way as they are protected from damage. They should be kept in their original packaging. Should you fear for the safety of the goods in any way, or you feel that the goods are causing any form of hazard you should contact us.

Where products and materials are delivered to, or stored at, the installation site you, the customer, shall not be liable for inspection, storage or handling of those goods. This does not preclude us asking you to check the goods received for any visible damage, and to ensure they are correct.

Should you terminate the contract for any reason, then we will make arrangements with you to collect the goods. If this happens then we will reimburse you if any of your money was used to purchase a proportion of the goods. If you do not make adequate and reasonable arrangements with us to allow the goods to be collected, we retain the right to take legal proceedings to recover the goods or their value. The amount of any reimbursement may be reduced by any reasonable costs we may have incurred.

### **11. Changes to the planned work**

If you decide to make changes to any planned work after you have signed this contract you should contact us without delay. Wherever possible we will incorporate your changes and if we are not able to do so we will inform you as to why it is not possible for us to do so.

Where we are able to agree to your changes, we will require that you set out, in writing and within fourteen days, confirmation of your request.

## Contract of Sale – for contracts agreed away from trade premises

You need to be aware that any changes to the original design may mean an adjustment to the cost of the installation. Any adjustment in the cost, either in addition or subtraction will be dealt with as a Variation of Contract and we will adjust the price by written agreement with you. You are also entitled to cancel the contract if there are changes in the original design or if the main Energy Generator differs to that in the quotation, as outlined in clause 2 of this contract.

There can be occasions when we come across unexpected work. Should this arise, we will discuss this with you. If it is an area of work in which we are competent to operate, we will issue you with a quotation to complete that work. We will have documented on the quotation the normal rate for the work of our installers. If the work is outside our area of competence, we will assist you in finding a suitably qualified contractor to carry out the work. If this unexpected work causes a delay in the installation process, we may need to make reasonable charges for this delay.

### **12. Late payment**

You should make the payments agreed on the quotation as they become due. The final payment will be due on completion of the installation. If you fail to make any agreed payment we may cease work. If you fail to pay the amount specified in an invoice sent to you by the agreed due date, then we reserve the right to charge you interest until you pay the amount due. The interest rate we will charge will be 3% above the Bank of England base rate.

It is not permissible under this contract to withhold any more than a proportionate amount of the outstanding balance for any alleged defect. If you do withhold any amount after a payment has become due, you should give us notice of your intention before the final date on which payment is due. You should also, with that notice, state the reasons for withholding

If we intend to cease work, we will give you notice of this in writing.

If you are in breach of this contract because you have not made a payment that was due to us and we have ceased work, you may have to compensate us for any additional costs we have incurred.

Dependent on the circumstances, we may require that the goods are returned to us. If necessary, we will take legal proceedings to recover the goods or/and any outstanding amounts due to us.

### **13. Mediation and arbitration**

Note: The RECC mediation and arbitration process only covers unresolved disputes arising from issues connected to the sale and installation of small scale renewable technologies.

If at any time a dispute arises between you and us that cannot be resolved you can refer the matter to be handled through RECC's dispute resolution procedure, provided it falls within their remit. We must agree to follow this procedure if that is your wish. RECC is certified through the Chartered Trading Standards Institute as an Alternative Dispute Resolution provider. You can find further information on the RECC website: [www.recc.org.uk/consumers/how-to-complain](http://www.recc.org.uk/consumers/how-to-complain).

If you register a dispute with RECC it will be allocated to a RECC caseworker, who will mediate between both parties in order to resolve the dispute. Mediation aims to reach a non-legal solution to the dispute in a reasonable timescale.

If an agreement is not reached through mediation for any reason, you can refer the matter to RECC's independent arbitration service and we must agree to arbitration if that is your wish. You would have to pay a small fee directly to the arbitration provider which may be refunded to you if the arbitrator finds in your favour.

## Contract of Sale – for contracts agreed away from trade premises

You can find more information on the RECC website: [www.recc.org.uk/consumers/how-to-complain/independent-arbitration](http://www.recc.org.uk/consumers/how-to-complain/independent-arbitration)

An award made under the independent arbitration service will be final and legally binding on you and us. You and we may only challenge the award on certain limited grounds under the Arbitration Act 1996.

Disputes that relate to the MCS Installer Standards can be referred to our MCS Certification Body. We will supply their contact details to you on request.

**We recommend that you read the Renewable Energy Consumer Code, it is available at [www.recc.org.uk](http://www.recc.org.uk)**

Haslewey Community Centre

[REDACTED]

Haslemere  
GU27 1LD

By email only:

[REDACTED]

[REDACTED]

Calls may be recorded for training or monitoring  
Date: 30 May 2023

Dear [REDACTED]

**Lease dated 11 November 2003  
Request for landlord consent to install rooftop solar panels at Haslewey**

With reference to your email dated 12 February 2023 proposing to install rooftop solar panels at Haslewey Community Centre as per the attached proposal by Raven Renewables dated 16 January 2023, I am now in a position to confirm that Waverley Borough Council, as landlord, has no objection to this proposal, subject to your compliance with the following terms and conditions:

1. The tenant shall, prior to the carrying out of the afore-mentioned works, at his own expense, obtain and comply with any appropriate consents under the Planning Acts, Fire Officer's recommendations, Building Regulations or any other statutory consents which may be required for these works and shall supply the landlord with copies of any such consents, plans or approvals immediately upon receipt.
2. The tenant shall make every effort to minimise any disturbance, damage, annoyance, inconvenience and/or nuisance arising due to the carrying out of the afore-mentioned works by the tenant, its lessees, servants, agents and/or contractors to Waverley Borough Council and the occupiers of neighbouring properties.
3. All the covenants given by the tenant under its lease shall be taken to apply to the works as completed and no claim for compensation shall be made in this respect at any time.
4. The landlord may require, in the event the work has not been carried out satisfactorily, the tenant to make good and reinstate the demised premises to their original condition and to the landlord's satisfaction at the end or sooner termination of his interest therein or at any earlier time which may be appropriate to the purpose hereof and shall make good all consequential damage thereby caused.



5. The tenant shall indemnify Waverley Borough Council against all costs, claims and charges of whatever kind which may arise from the grant of this approval, as long as it continues to be relied upon as authority for its purpose.
6. The works must be completed within twelve months of the date of this letter.
7. The consent is granted as landowner and shall not affect, restrict or diminish the powers or rights of Waverley Borough Council as local authority.
8. The consent by the landlord for the above-mentioned proposal shall not imply any warranty by or on behalf of the landlord and no liability of any description shall attach to the landlord in respect thereof.
9. Written notification, either by email to [property.estates@waverley.gov.uk](mailto:property.estates@waverley.gov.uk) or by post, of completion of the works shall be given to the asset investment manager as soon as the works have been carried out.
10. If any of the works authorised by this letter affect the insurance premium, the tenant is to covenant with Waverley Borough Council to (a) insure the works or (b) reimburse Waverley Borough Council for any additional premium.
11. Should the installation of the solar panels not be executed in accordance with this letter of consent, such a breach will constitute a breach of the terms of the lease dated 11 November 2003.

I should be grateful if you would confirm your acceptance of the above terms and conditions by completing the enclosed copy of this letter and then returning it to me. The exchange of correspondence can then be taken to be the granting of landlord's consent for the afore-mentioned works in accordance with Clause 4.9.4 of your Lease.

I look forward to hearing from you.

Yours sincerely,

[Redacted signature]

For and on behalf of  
Joint Executive Head for Assets & Property

I, [Redacted], as trustee acting on behalf of Haslewey Community Centre, do hereby accept the terms and conditions as set out in this letter.

Signed [Redacted] Dated 30/05/2023

# Quotation

Reference 1340  
Date 28 February 2023



To **Haslewey Community Centre**  
Lion Green  
Haslemere  
GU27 1LD

## Vision2030 Limited

821 Bath Road  
Brislington  
Bristol  
BS4 5NL

Tel: 0333 335 5362 (office hours 9.00  
-5.00 Monday - Friday)

Mobile: 07584 992672

Email: gary@vision2030.co.uk

Web: www.vision2030.co.uk

Dear [REDACTED]

Thank you for asking us to look at your project. Following our conversation in regard to helping you future proof your property against ever increasing energy costs & becoming greener & cleaner with your energy, you will find your quote attached.

Feel free to reach out to myself with any questions you may have & we look forward to assisting in your transition to your own energy supply.

We have also attached the supporting documentation from our supply partners introducing the technical specification & warranty details for the products we are proposing to install for your project.

Your energy cost for your current annual consumption of **50,000kWh @57p** per kWh will now be costing **£28,500.00**.

As you will see from the attached irradiation maps, it is fair to assume that your system will generate **1000kWh** per kW installed totalling **26,000kWh** per annum.

We would expect you to use up to **60%** of this free energy via your home demand & export the remaining **40%** to the grid for an average of **5.5p per kWh**.

So adding these figures together your annual savings **could** work out to **£9464.00** in year one which works out to a ROI of **35.05%**.

**Your contribution to environmental measures by reducing your CO2 footprint from this installation works out to 8034kgs in year one & over 25 years your carbon emission savings are 200.850 tonnes which is the equivalent of 88 cars each driving 10,000 miles in one year.**

Calculations based on Ofgem's price cap report here:

<https://www.ofgem.gov.uk/information-consumers/energy-advice-households/check-if-energy-price-cap-affects-you>.

You also will find attached within the data sheets and product information, all warranties that are applied to the





## individual products.

Please get in touch if you'd like to talk it through. If you would like to discuss this via a Zoom call please let us know & we will arrange a convenient time with you.

We are always happy to answer any questions you might have.

### 26kW All Black PV Solar System

65 x 400watt All Black Solar Panels to create a 26kW PV System	£27,000.00
1 x Mounting System for Slate Tile	20% VAT · £5,400.00
Layout Of Panels: 65 x Portrait	
On 2 Roof/s	
1 x 20kW Solis Inverter	
1 x Wifi Dongle For System Monitoring	
1 x Cable Run Materials - Conduit/Trunking	
1 x All necessary accessories to complement installation	
1 x Installation & commissioning services for all of the above	
1 x DNO Application for G99 Pemoissions	
<b>Scaffolding NOT included</b>	

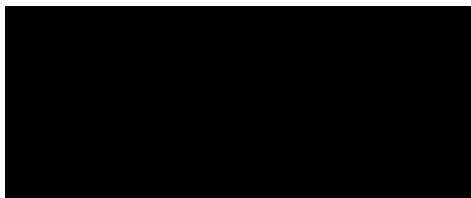
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Sub total	£27,000.00
20% VAT	£5,400.00

**Total £32,400.00**

## Notes

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If you would like to pay by card, please visit our website [www.vision2030.co.uk](http://www.vision2030.co.uk) & go to our payments page where we have a secure online portal for safe card payments.

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## Terms

### Our Terms are:

25% Deposit with Order	= £8,100.00
35% Balance of Deposit with Confirmation of Installation date	= £11,340.00
40% Amount on completion	= £12,960.00
<b>Total payment</b>	<b>= £32,400.00</b>



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**Company Registration Number:** 11405260

**VAT Number:** 360253720





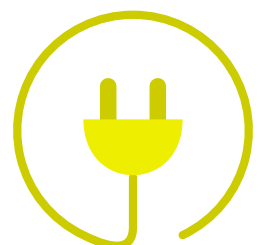
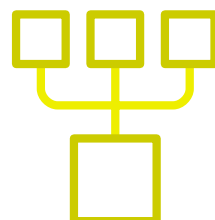
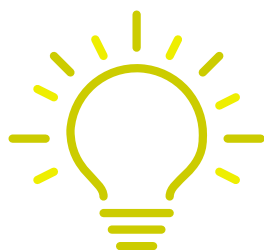
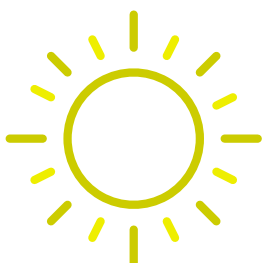
**[REDACTED] (Haslewey Community Centre)**

**Project Name:** 20% VAT Haslewey Community Centre, Lion Green, Haslemere GU27 1LD

**Address:** Haslewey Community Centre, Lion Green, Haslemere , GU27 1LD

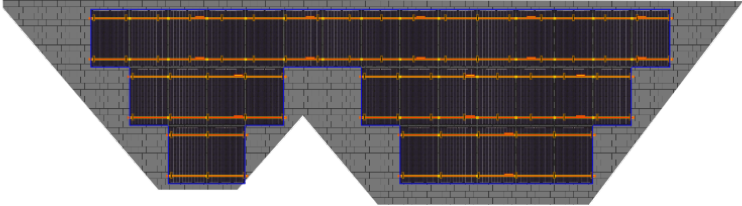
**Date Created:** 5th April 2023

**Designer:** [REDACTED]

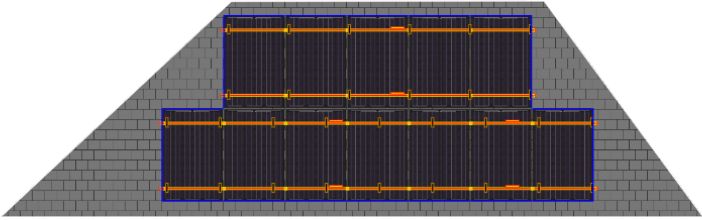


# Roof Layout

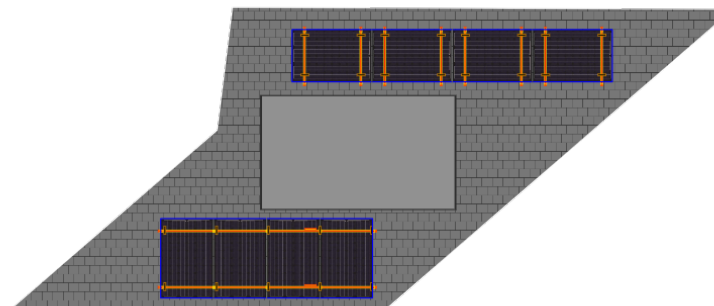
Roof 1



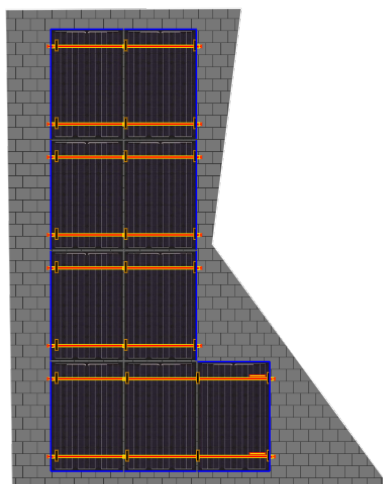
Roof 2
















## Roof 3



## Roof 4



# Component list

Item	Quantity
 *HIB* Longi HiMo5 400W All Black Mono solar panel	62
 SolaX X3 G4 15.0kW hybrid inverter	1
 Solax X3-PRO 3 Phase Inverter 8.0kW inverter	1
 Emlite EMP1 Three Phase meter	1
 Label sheet	2
 BMS for Triple Power Batteries T-BAT BMS (MC0500)	1
 AC isolator - KN 25A 4-pole	2
 SolaX Triple 5.8kWh LFP Battery (Master Console)	1
 SolaX Triple 5.8kWh LFP Battery (Slave Console)	1
 K&N DC isolator - KGD40-3	1
Pair of MC4 connectors	10
 IMO DC isolator 16A 2p 1string	1
 AC isolator - KN Newbury 20A 4-pole	2
 50m reel of 10mm <sup>2</sup> solar cable	3
100m reel of 6mm <sup>2</sup> solar cable	2

Fastensol end clamp (30mm black)	64
Fastensol mid clamp (30mm black)	92
Fastensol black end cap	64
Fastensol portrait slate roof hook	150
Fastensol rail splice	28
Galvanized mesh BirdBlocker (30m) (black)	5
Fastensol silver rail 3300mm	49
Fastensol landscape slate roof hook	16



# Inverter checks

## SolaX X3 G4 15.0kW hybrid

### Panels

PV power **16800** Rated AC output **15000**

Input 1: 14 \*HIB\* Longi HiMo5 400W All Black Mono solar panels in 2 strings

### Panels

### Inverter

PV power	<b>11200 W</b>		
Open circuit voltage at -10° C	<b>565 V</b>	Max DC voltage	<b>1000 V</b>
V <sub>mpp</sub> at 40° C	<b>418 V</b>	V <sub>mpp</sub> lower limit	<b>180 V</b>
V <sub>mpp</sub> at -10° C	<b>478 V</b>	V <sub>mpp</sub> upper limit	<b>950 V</b>
I <sub>mpp</sub> at 40° C	<b>26 A</b>	Max DC input current	<b>26 A</b>

#### Max voltage

The open circuit voltage of the solar panels never exceeds the voltage limit of the inverter.



#### Max power point range

The maximum power point voltage of the solar panels is always above the lower limit of the inverter MPPT tracker. The maximum power point voltage of the solar panels is always below the upper limit of the inverter MPPT tracker.





### Max Current

The maximum power point current of the solar panels is always below the maximum current for the inverter MPPT tracker.



Input 2: 14 \*HIB\* Longi HiMo5 400W All Black Mono solar panels in 1 strings

Panels		Inverter	
PV power	<b>5600 W</b>		
Open circuit voltage at -10° C	<b>565 V</b>	Max DC voltage	<b>1000 V</b>
V <sub>mpp</sub> at 40° C	<b>418 V</b>	V <sub>mpp</sub> lower limit	<b>180 V</b>
V <sub>mpp</sub> at -10° C	<b>478 V</b>	V <sub>mpp</sub> upper limit	<b>950 V</b>
I <sub>mpp</sub> at 40° C	<b>13 A</b>	Max DC input current	<b>16 A</b>

### Max voltage

The open circuit voltage of the solar panels never exceeds the voltage limit of the inverter.



### Max power point range

The maximum power point voltage of the solar panels is always above the lower limit of the inverter MPPT tracker. The maximum power point voltage of the solar panels is always below the upper limit of the inverter MPPT tracker.



### Max Current

The maximum power point current of the solar panels is always below the maximum current for the inverter MPPT tracker.



# Solax X3-PRO 3 Phase Inverter 8.0kW

## Panels

PV power **8000** Rated AC output **8000**

Input 1: 9 \*HIB\* Longi HiMo5 400W All Black Mono solar panels in 1 strings

## Panels

## Inverter

PV power	<b>3600 W</b>		
Open circuit voltage at -10° C	<b>363 V</b>	Max DC voltage	<b>1100 V</b>
V <sub>mpp</sub> at 40° C	<b>269 V</b>	V <sub>mpp</sub> lower limit	<b>160 V</b>
V <sub>mpp</sub> at -10° C	<b>307 V</b>	V <sub>mpp</sub> upper limit	<b>980 V</b>
I <sub>mpp</sub> at 40° C	<b>13 A</b>	Max DC input current	<b>32 A</b>

### Max voltage

The open circuit voltage of the solar panels never exceeds the voltage limit of the inverter.



### Max power point range

The maximum power point voltage of the solar panels is always above the lower limit of the inverter MPPT tracker. The maximum power point voltage of the solar panels is always below the upper limit of the inverter MPPT tracker.



### Max Current

The maximum power point current of the solar panels is always below the maximum current for the inverter MPPT tracker.



Input 2: 11 \*HIB\* Longi HiMo5 400W All Black Mono solar panels in 1 strings

Panels		Inverter	
PV power	<b>4400 W</b>		
Open circuit voltage at -10° C	<b>444 V</b>	Max DC voltage	<b>1100 V</b>
V <sub>mpp</sub> at 40° C	<b>329 V</b>	V <sub>mpp</sub> lower limit	<b>160 V</b>
V <sub>mpp</sub> at -10° C	<b>375 V</b>	V <sub>mpp</sub> upper limit	<b>980 V</b>
I <sub>mpp</sub> at 40° C	<b>13 A</b>	Max DC input current	<b>32 A</b>

### Max voltage

The open circuit voltage of the solar panels never exceeds the voltage limit of the inverter.



### Max power point range

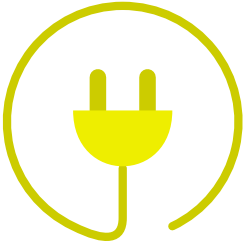
The maximum power point voltage of the solar panels is always above the lower limit of the inverter MPPT tracker. The maximum power point voltage of the solar panels is always below the upper limit of the inverter MPPT tracker.



### Max Current

The maximum power point current of the solar panels is always below the maximum current for the inverter MPPT tracker.





# Electrical

## SolaX X3 G4 15.0kW hybrid



### AC Isolator

A AC isolator - KN 25A 4-pole has been specified for this input

#### Current

The rated isolator current (25A) is greater than the rated inverter current (24.1A)



#### Phases

The isolator is suitable for use on a three phase inverter.



## Input 1



### DC Isolator

A K&N DC isolator - KGD40-3 has been specified for this input

#### Current

The isolator is rated for a current of 40A, which is more than the expected maximum current of 28A.



### Voltage

At 40A the isolator is rated for a voltage of 600V, which is more than the expected maximum voltage of 565V.



## Cable

30m of 10mm<sup>2</sup> solar cable has been specified

### Voltage drop

Voltage drop at maximum power point at 40°C will be around **2.85 V (0.68 percent)**



---

## Input 2



## DC Isolator

A IMO DC isolator 16A 2p 1string has been specified for this input

### Current

The isolator is rated for a current of 16A, which is more than the expected maximum current of 14A.



### Voltage

At 16A the isolator is rated for a voltage of 600V, which is more than the expected maximum voltage of 565V.





## Cable

30m of 6mm<sup>2</sup> solar cable has been specified

### Voltage drop

Voltage drop at maximum power point at 40°C will be around **2.26 V (0.54 percent)**



---

## Solax X3-PRO 3 Phase Inverter 8.0kW



## AC Isolator

A AC isolator - KN Newbury 20A 4-pole has been specified for this input

### Current

The rated isolator current (20A) is greater than the rated inverter current (12.2A)



### Phases

The isolator is suitable for use on a three phase inverter.



---

## Input 1



## DC Isolator

### Integrated isolator

This inverter contains an integrated DC Isolator.





## Cable

30m of 6mm<sup>2</sup> solar cable has been specified

### Voltage drop

Voltage drop at maximum power point at 40°C will be around  
**2.26 V (0.84 percent)**



## Input 2



## DC Isolator

### Integrated isolator

This inverter contains an integrated DC Isolator.



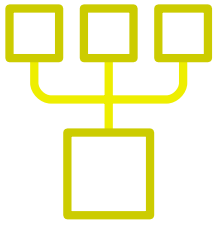
## Cable

30m of 6mm<sup>2</sup> solar cable has been specified

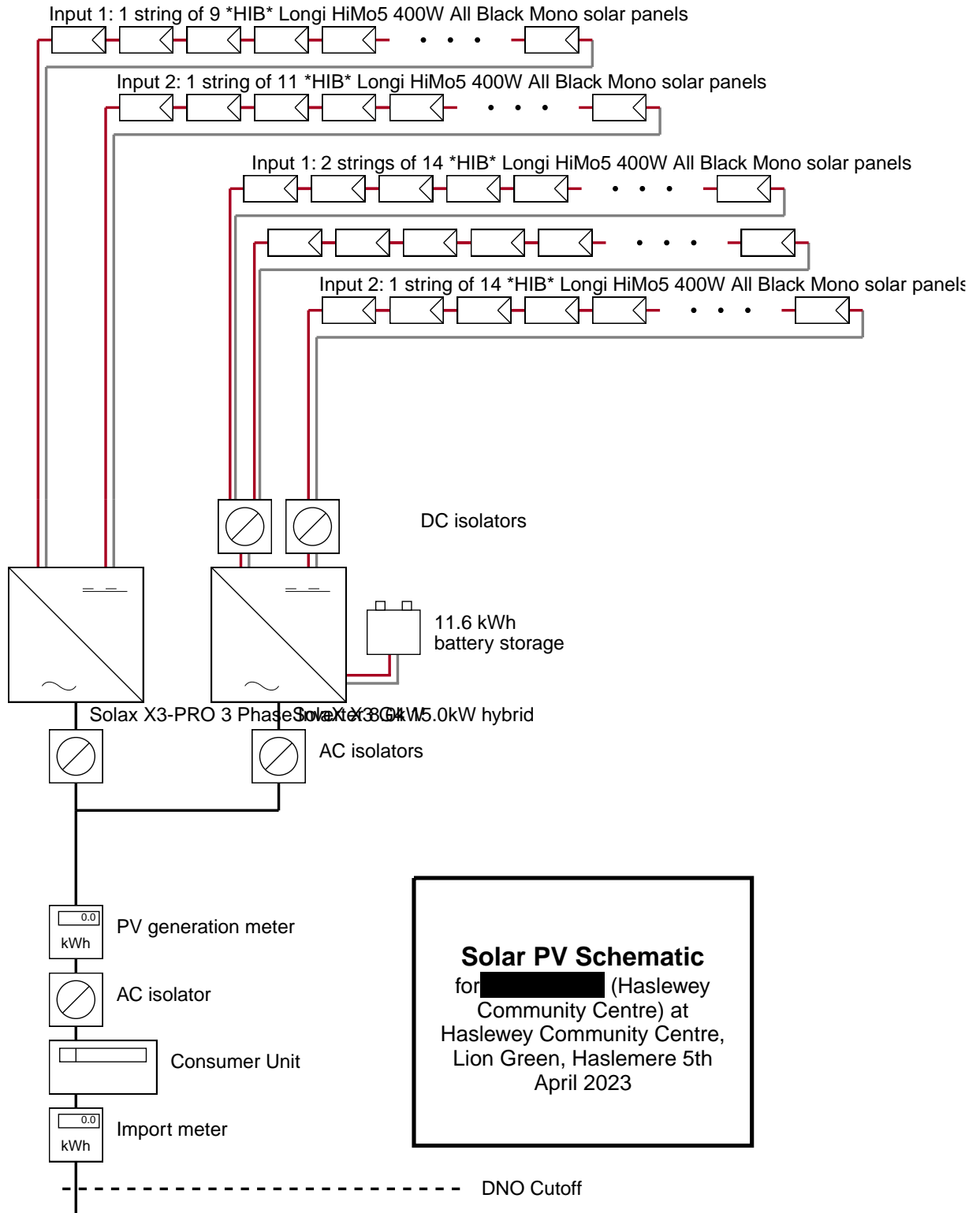
### Voltage drop

Voltage drop at maximum power point at 40°C will be around  
**2.26 V (0.69 percent)**

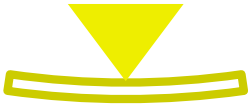




# Schematic diagram







# Structural calculations

## Weight loading calculations

For a traditional cut roof with rafters and purlins we recommend also using our rafter calculator to check the load-bearing capacity of the rafters. Even if the increase in loading is more than 15% the rafters may well be able to take the additional weight.

Please note that this method does not calculate the strength of the roof, and if a roof was badly constructed, does not meet existing building regulations, or is in poor condition then it may still not be appropriate to install an array.

### Roof 1

Dead load from roof covering	0.34 kN/m <sup>2</sup>
Imposed load	0.75 kN/m <sup>2</sup>
<b>Total loading without solar array</b>	<b>1.09 kN/m<sup>2</sup></b>
Weight of solar panels and mounting	838.1 kg
Area covered by solar array	64.4 m <sup>2</sup>
Loading imposed by solar array	0.13 kN/m <sup>2</sup>
<b>Total loading with solar array</b>	<b>1.2 kN/m<sup>2</sup></b>

**Increase in loading  
due to solar array: 11.9%**

An increase of less than 15% in the load imposed on a roof is not considered to be a significant change (The Building Regulations 2010, Approved Document A).



## Roof 2

Dead load from roof covering	0.34 kN/m <sup>2</sup>
Imposed load	0.75 kN/m <sup>2</sup>
<b>Total loading without solar array</b>	<b>1.09 kN/m<sup>2</sup></b>

Weight of solar panels and mounting	304.1 kg
Area covered by solar array	23.4 m <sup>2</sup>
Loading imposed by solar array	0.13 kN/m <sup>2</sup>
<b>Total loading with solar array</b>	<b>1.2 kN/m<sup>2</sup></b>

**Increase in loading  
due to solar array: 11.9%**

An increase of less than 15% in the load imposed on a roof is not considered to be a significant change (The Building Regulations 2010, Approved Document A).



### Roof 3

Dead load from roof covering	0.34 kN/m <sup>2</sup>
Imposed load	0.75 kN/m <sup>2</sup>
<b>Total loading without solar array</b>	<b>1.09 kN/m<sup>2</sup></b>

Weight of solar panels and mounting	209.9 kg
Area covered by solar array	15.6 m <sup>2</sup>
Loading imposed by solar array	0.13 kN/m <sup>2</sup>
<b>Total loading with solar array</b>	<b>1.2 kN/m<sup>2</sup></b>

**Increase in loading  
due to solar array: 11.9%**

An increase of less than 15% in the load imposed on a roof is not considered to be a significant change (The Building Regulations 2010, Approved Document A).



## Roof 4

Dead load from roof covering	0.34 kN/m <sup>2</sup>
Imposed load	0.75 kN/m <sup>2</sup>
<b>Total loading without solar array</b>	<b>1.09 kN/m<sup>2</sup></b>

Weight of solar panels and mounting	233.5 kg
Area covered by solar array	17.6 m <sup>2</sup>
Loading imposed by solar array	0.13 kN/m <sup>2</sup>
<b>Total loading with solar array</b>	<b>1.2 kN/m<sup>2</sup></b>

**Increase in loading  
due to solar array: 11.9%**

An increase of less than 15% in the load imposed on a roof is not considered to be a significant change (The Building Regulations 2010, Approved Document A).



# Span tables calculations

---

## Roof 1

Total dead load of solar array, mounting and roof covering	0.47 kN/m <sup>2</sup>
Roof pitch	30
Rafter depth	100
Rafter breadth	38
<b>Maximum unsupported span</b>	<b>1</b>
<b>Maximum permitted span</b>	<b>2.02</b>

For a dead load of not more than 0.50kN/m<sup>2</sup> and a roof pitch of 22.5 to 30 degrees, with roof timbers of 38 x 100 mm at 600 centers, the maximum permitted unsupported span according to Trada span tables is 2.02m.

The maximum unsupported length of the roof timbers is within the permitted span.



## Roof 2

Total dead load of solar array, mounting and roof covering	0.47 kN/m <sup>2</sup>
Roof pitch	30
Rafter depth	100
Rafter breadth	38
<b>Maximum unsupported span</b>	<b>1</b>
<b>Maximum permitted span</b>	<b>2.02</b>

For a dead load of not more than 0.50kN/m<sup>2</sup> and a roof pitch of 22.5 to 30 degrees, with roof timbers of 38 x 100 mm at 600 centers, the maximum permitted unsupported span according to Trada span tables is 2.02m.

The maximum unsupported length of the roof timbers is within the permitted span.



### Roof 3

Total dead load of solar array, mounting and roof covering	0.48 kN/m <sup>2</sup>
Roof pitch	30
Rafter depth	100
Rafter breadth	38
<b>Maximum unsupported span</b>	<b>1</b>
<b>Maximum permitted span</b>	<b>2.02</b>

For a dead load of not more than 0.50kN/m<sup>2</sup> and a roof pitch of 22.5 to 30 degrees, with roof timbers of 38 x 100 mm at 600 centers, the maximum permitted unsupported span according to Trada span tables is 2.02m.

The maximum unsupported length of the roof timbers is within the permitted span.



### Roof 4

Total dead load of solar array, mounting and roof covering	0.47 kN/m <sup>2</sup>
Roof pitch	30
Rafter depth	100
Rafter breadth	38
<b>Maximum unsupported span</b>	<b>1</b>
<b>Maximum permitted span</b>	<b>2.02</b>

For a dead load of not more than 0.50kN/m<sup>2</sup> and a roof pitch of 22.5 to 30 degrees, with roof timbers of 38 x 100 mm at 600 centers, the maximum permitted unsupported span according to Trada span tables is 2.02m.

The maximum unsupported length of the roof timbers is within the permitted span.



# Wind loading calculations

The maximum force acting on a solar array from wind loading is given by the following formula in BRE Digest 489:

$$F = q_p \times C_{p \text{ net}} \times C_a \times C_t \times A_{\text{ref}}$$

## Roof 1

$Q_p$	872 Pa	
From Fig 34 in Guide to the Installation of Photovoltaic Systems for a building 10 m high, in windzone 1, in country terrain, at a distance of greater than 20km from the sea		
$C_{p \text{ net}}$	Roof Centre	Roof edge
Uplift	-1.3	-2.2
Pressure	1	1.1
$C_a$	1.074	
At an altitude of 12m		
$C_t$	1	
When there is no significant topography		
$A_{\text{ref}}$	64.44m <sup>2</sup>	
<b>F</b>	Roof Centre	Roof edge
<b>Uplift</b>	<b>-78456N</b>	<b>-132771N</b>
<b>Pressure</b>	<b>60351N</b>	<b>66386N</b>

With 84 roof hooks we should allow for an uplift force per hook in the central zone of **934N**, rising to **1581N** at the edges. If 2 screws are used per roof hook, this equates to **467N** per fixing in the central zone, and **790N** at the edges.

Roof hooks for slate roofs are fixed with screws that pass through the 5mm plate of the roof hook and a 20mm batten (or spacing pad of wood) before being driven home in the rafter. So there is approximately 45 mm of thread in the timber. The pull-out force in C16 timber is given by tables and formulae in BS5268 Part 2:

$$17.3 \times 1.25 \times 45 = 973N$$

The pullout force on the fixings is more than the expected wind loading, even when the fixings are close to the edge of the roof.



## Roof 2

$Q_p$  872 Pa

From Fig 34 in Guide to the Installation of Photovoltaic Systems for a building 10 m high, in windzone 1, in country terrain, at a distance of greater than 20km from the sea

$C_{p \text{ net}}$	Roof Centre	Roof edge
Uplift	-1.3	-2.2
Pressure	1	1.1

$C_a$  1.074

At an altitude of 12m

$C_t$  1

When there is no significant topography

$A_{\text{ref}}$  23.43m<sup>2</sup>

F	Roof Centre	Roof edge
<b>Uplift</b>	<b>-28529N</b>	<b>-48280N</b>
<b>Pressure</b>	<b>21946N</b>	<b>24140N</b>

With 30 roof hooks we should allow for an uplift force per hook in the central zone of **951N**, rising to **1609N** at the edges. If 2 screws are used per roof hook, this equates to **475N** per fixing in the central zone, and **805N** at the edges.

Roof hooks for slate roofs are fixed with screws that pass through the 5mm plate of the roof hook and a 20mm batten (or spacing pad of wood) before being driven home in the rafter. So there is approximately 45 mm of thread in the timber. The pull-out force in C16 timber is given by tables and formulae in BS5268 Part 2:

$$17.3 \times 1.25 \times 45 = 973N$$

The pullout force on the fixings is more than the expected wind loading, even when the fixings are close to the edge of the roof.





### Roof 3

$Q_p$  872 Pa

From Fig 34 in Guide to the Installation of Photovoltaic Systems for a building 10 m high, in windzone 1, in country terrain, at a distance of greater than 20km from the sea

$C_{p\ net}$	Roof Centre	Roof edge
Uplift	-1.3	-2.2
Pressure	1	1.1

$C_a$  1.074

At an altitude of 12m

$C_t$  1

When there is no significant topography

$A_{ref}$  15.62m<sup>2</sup>

F	Roof Centre	Roof edge
<b>Uplift</b>	<b>-19020N</b>	<b>-32187N</b>
<b>Pressure</b>	<b>14630N</b>	<b>16093N</b>

With 26 roof hooks we should allow for an uplift force per hook in the central zone of **732N**, rising to **1238N** at the edges. If 2 screws are used per roof hook, this equates to **366N** per fixing in the central zone, and **619N** at the edges.

Roof hooks for slate roofs are fixed with screws that pass through the 5mm plate of the roof hook and a 20mm batten (or spacing pad of wood) before being driven home in the rafter. So there is approximately 45 mm of thread in the timber. The pull-out force in C16 timber is given by tables and formulae in BS5268 Part 2:

$$17.3 \times 1.25 \times 45 = 973N$$

The pullout force on the fixings is more than the expected wind loading, even when the fixings are close to the edge of the roof.



## Roof 4

$Q_p$  872 Pa

From Fig 34 in Guide to the Installation of Photovoltaic Systems for a building 10 m high, in windzone 1, in country terrain, at a distance of greater than 20km from the sea

$C_{p \text{ net}}$	Roof Centre	Roof edge
Uplift	-1.3	-2.2
Pressure	1	1.1

$C_a$  1.074

At an altitude of 12m

$C_t$  1

When there is no significant topography

$A_{\text{ref}}$  17.57m<sup>2</sup>

F	Roof Centre	Roof edge
<b>Uplift</b>	<b>-21397N</b>	<b>-36210N</b>
<b>Pressure</b>	<b>16459N</b>	<b>18105N</b>

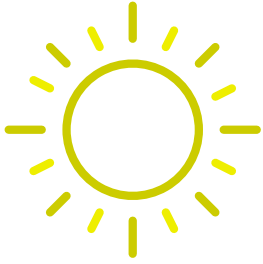
With 26 roof hooks we should allow for an uplift force per hook in the central zone of **823N**, rising to **1393N** at the edges. If 2 screws are used per roof hook, this equates to **411N** per fixing in the central zone, and **696N** at the edges.

Roof hooks for slate roofs are fixed with screws that pass through the 5mm plate of the roof hook and a 20mm batten (or spacing pad of wood) before being driven home in the rafter. So there is approximately 45 mm of thread in the timber. The pull-out force in C16 timber is given by tables and formulae in BS5268 Part 2:

$$17.3 \times 1.25 \times 45 = 973\text{N}$$

The pullout force on the fixings is more than the expected wind loading, even when the fixings are close to the edge of the roof.





# Performance Estimate

## Site details

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**Client** [REDACTED] (Haslewey Community Centre)

**Address** Haslewey Community Centre, Lion Green, Haslemere

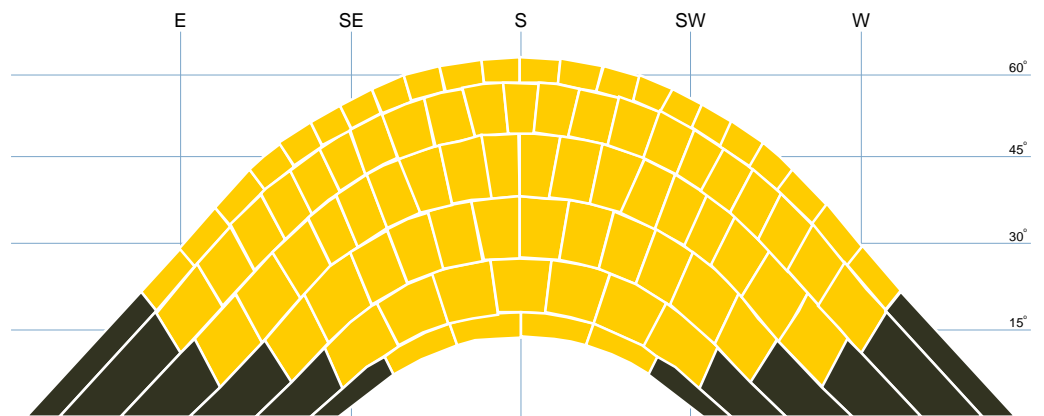
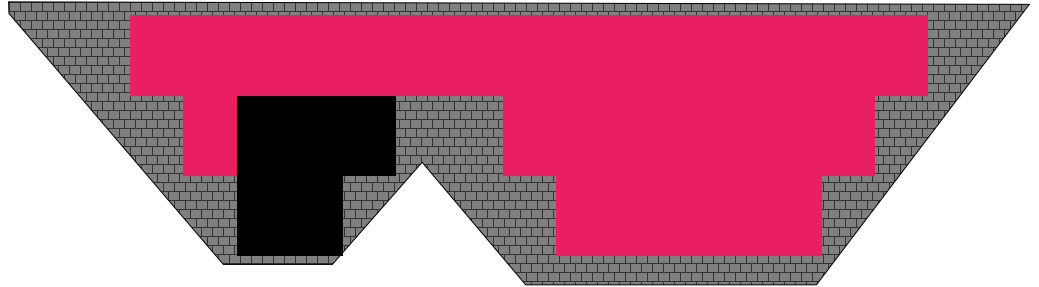
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The sunpath diagram shows the arcs of the sky that the sun passes through at different times of the day and year as yellow blocks. The shaded area indicates the horizon as seen from the location of the solar array. Where objects on the horizon are within 10m of the array, an added semi-circle is drawn to represent the increased shading. Blocks of the sky that are shaded by objects on the horizon are coloured red, and a shading factor is calculated from the number of red blocks. The performance of the solar array is calculated by multiplying the size of the array (kWp) by the shading factor (sf) and a site correction factor (kk), taken from tables which take account of the geographical location, orientation and inclination of the array.

# Inverter 1

SolaX X3 G4 15.0kW hybrid

## Input 1



### A. Installation data

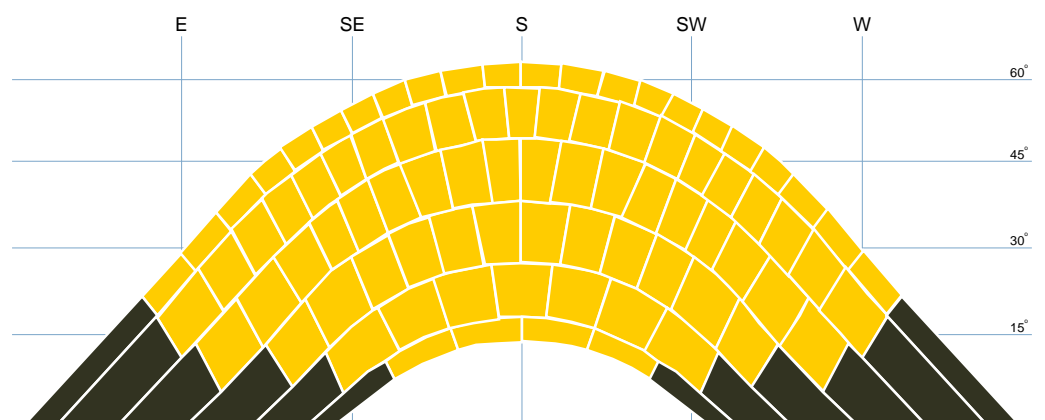
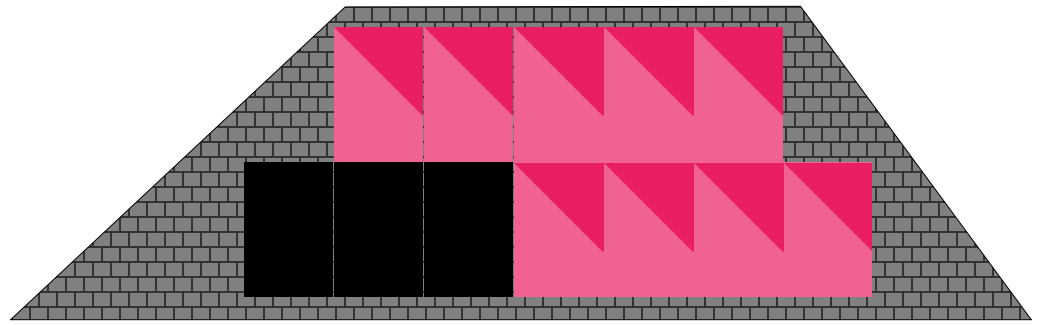
Installed capacity of PV system - kWp (stc)	11.200	kWp
Orientation of the PV system - degrees from South	-54	°
Inclination of system - degrees from horizontal	30	°
Postcode region	1	



### B. Performance calculations

kWh/kWp (Kk)	901	kWh/kWp
Shade factor (SF)	1.00	
Estimated output (kWp x Kk x SF)	10091	kWh

## Input 2



### A. Installation data

Installed capacity of PV system - kWp (stc)	5.600	kWp
Orientation of the PV system - degrees from South	-54	°
Inclination of system - degrees from horizontal	30	°
Postcode region	1	



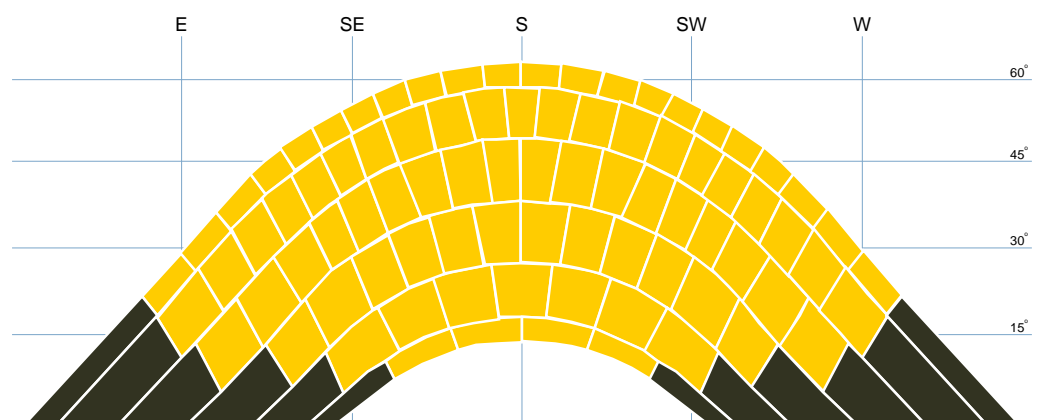
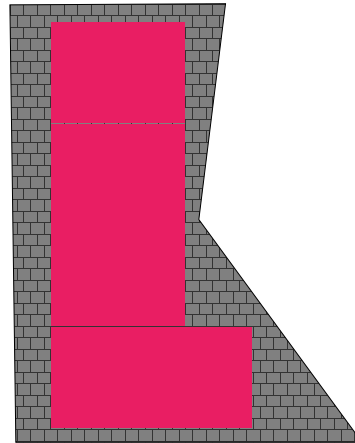
### B. Performance calculations

kWh/kWp (Kk)	901	kWh/kWp
Shade factor (SF)	1.00	
Estimated output (kWp x Kk x SF)	5046	kWh

## Inverter 2

Solax X3-PRO 3 Phase Inverter 8.0kW

# Input 1



## A. Installation data

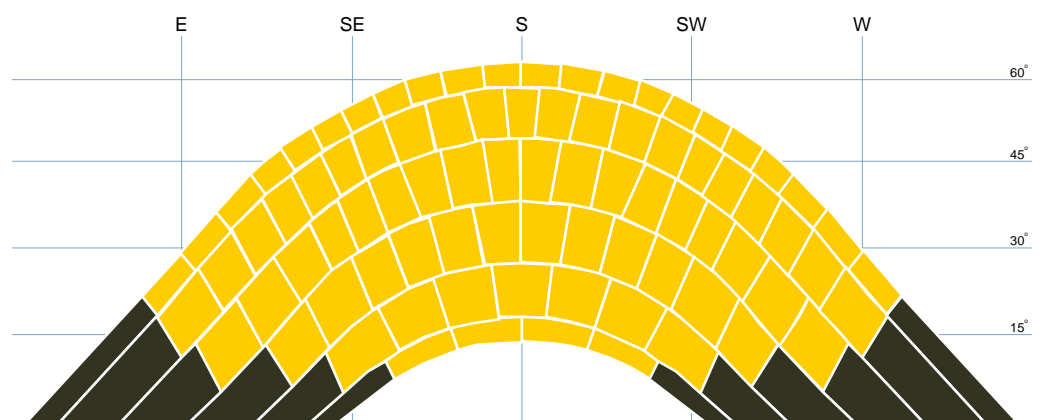
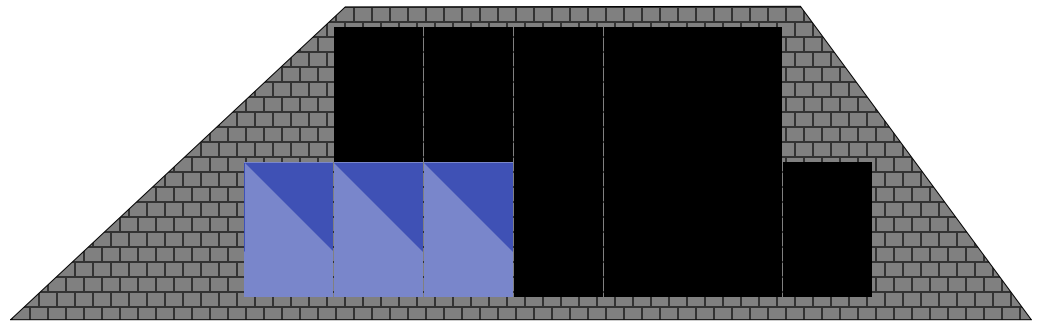
Installed capacity of PV system - kWp (stc)	3.600	kWp
Orientation of the PV system - degrees from South	-8	°
Inclination of system - degrees from horizontal	30	°
Postcode region	1	



## B. Performance calculations

kWh/kWp (Kk)	974	kWh/kWp
Shade factor (SF)	1.00	
Estimated output (kWp x Kk x SF)	3506	kWh

## Input 2



### A. Installation data

Installed capacity of PV system - kWp (stc)	4.400	kWp
Orientation of the PV system - degrees from South	-54	°
Inclination of system - degrees from horizontal	30	°
Postcode region	1	



### B. Performance calculations

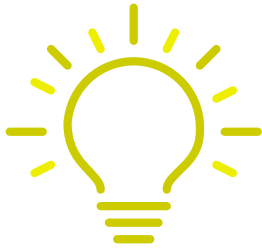
kWh/kWp (Kk)	901	kWh/kWp
Shade factor (SF)	1.00	
Estimated output (kWp x Kk x SF)	3964	kWh

# Performance Summary

<b>A. Installation data</b>		
Installed capacity of PV system - kWp (stc)	24.799999999999999 07	kWp
Orientation of the PV system - degrees from South	See individual inputs	
Inclination of system - degrees from horizontal	See individual inputs	
Postcode region	1	
<b>B. Performance calculations</b>		
kWh/kWp (Kk)	See individual inputs	
Shade factor (SF)	See individual inputs	
Estimated output (kWp x Kk x SF)	22607	kWh

**Important Note:** 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. This estimate is based upon the standard MCS procedure is given as guidance only for the first year of generation. It should not be considered as a guarantee of performance.





# Self consumption

We model here the performance of a solar PV system with battery storage over the course of a year, using high resolution minute-by-minute generation data for a typical PV system and consumption data for a typical house, and calculating the flow of energy from the solar panels to the house and the battery during the day, and from the storage battery back to the house at night - or from the grid to the house when the battery is empty or loads exceed the discharge capacity of the system.

We provide yearly profiles of generation, consumption, import / export and battery utilisation, along with detailed profiles for a typical spring day.

## Battery system specification

SolaX X3 G4 15.0kW hybrid with 2 SolaX Triple 5.8kWh LFP Battery batteries

Charge rate	6000 W
Inverter charge efficiency	98.5 %
Inverter discharge efficiency	98.5 %
Battery efficiency	95.0 %
Round trip efficiency	92.2 %
Battery bank capacity	11.6 kWh
Max discharge depth	90 %
Usable capacity	10.44 kWh



### Consumption

Electricity consumed in the property each year

60000 kWh



### Generation

Electricity generated by the PV array each year

22686 kWh



### Self consumption

Proportion of PV generation used in the property

72 %



### Independence

Proportion of electricity consumption provided by PV

27 %



### Import / Export

Electricity import / export each year from the property

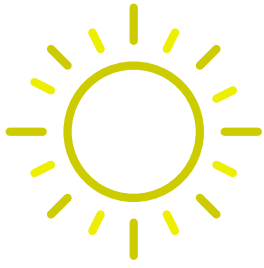
44042 / 6280 kWh



### Utilisation

Average daily utilisation of the storage battery

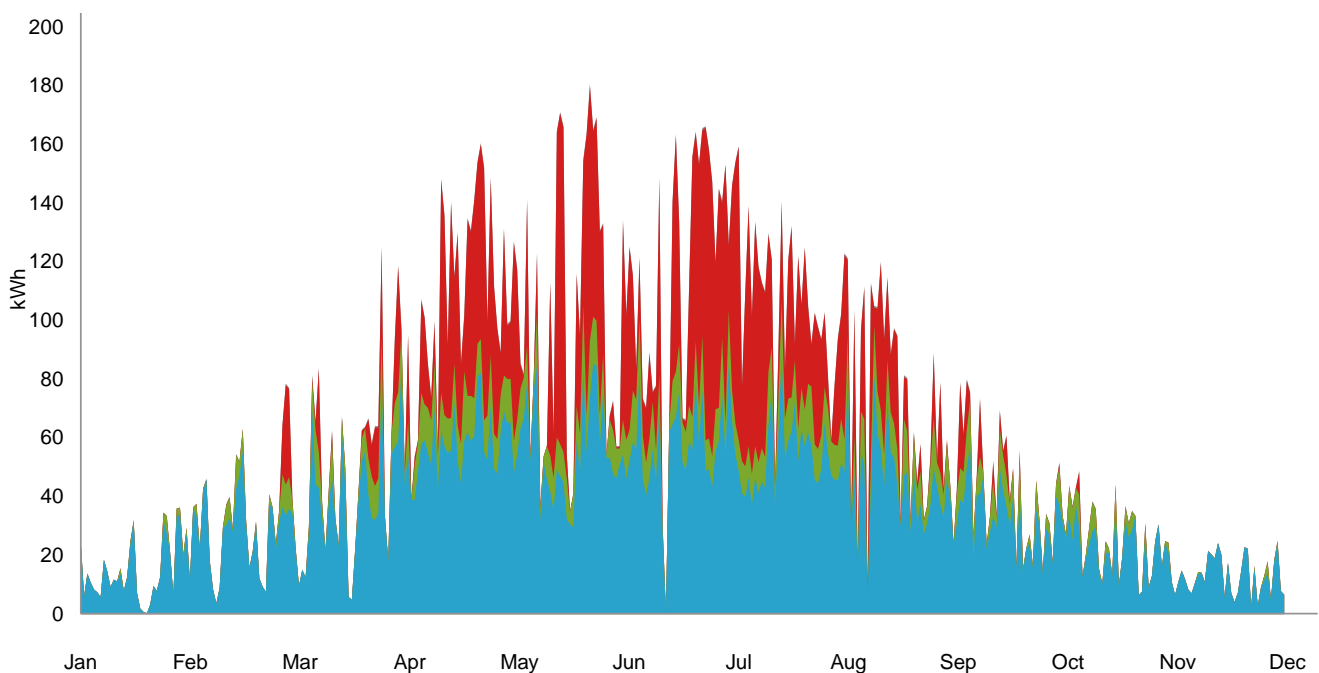
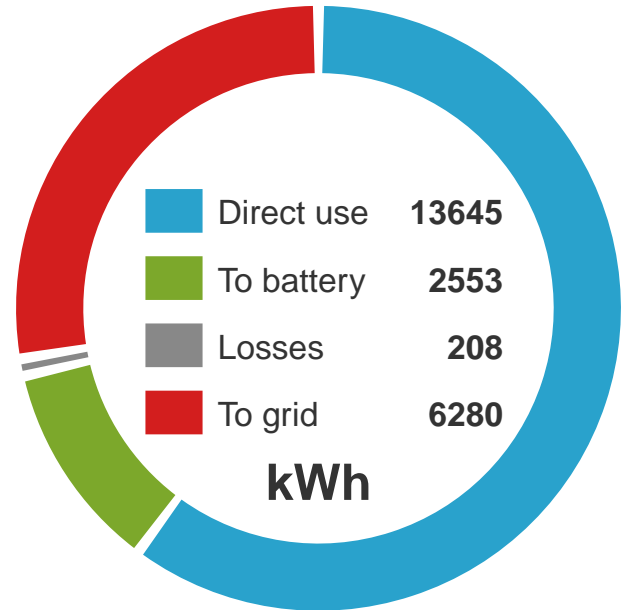
69 %

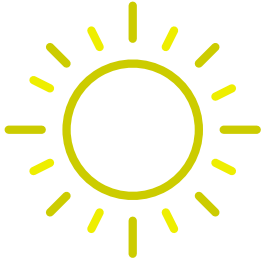


# Yearly generation

The solar PV array is expected to generate 22686 kWh over a typical year. The graph shows whether the generated energy is used directly in the house, used to charge the storage battery, or exported to the grid.

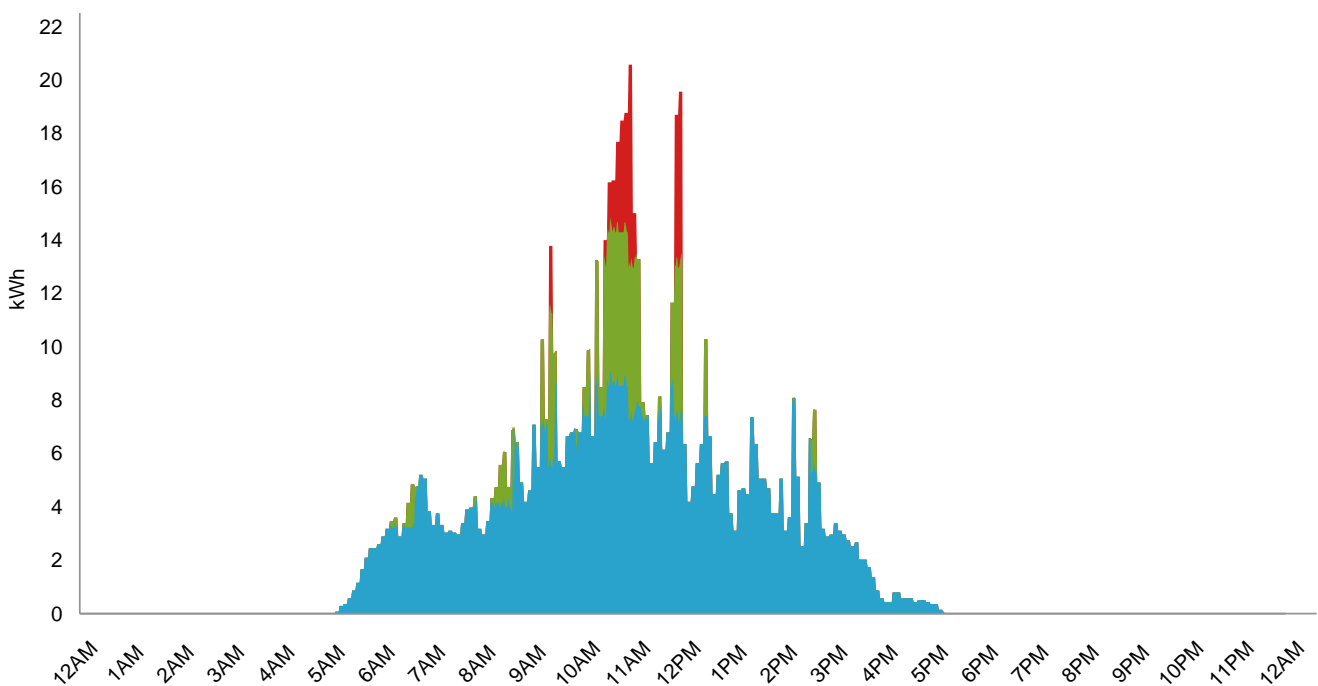
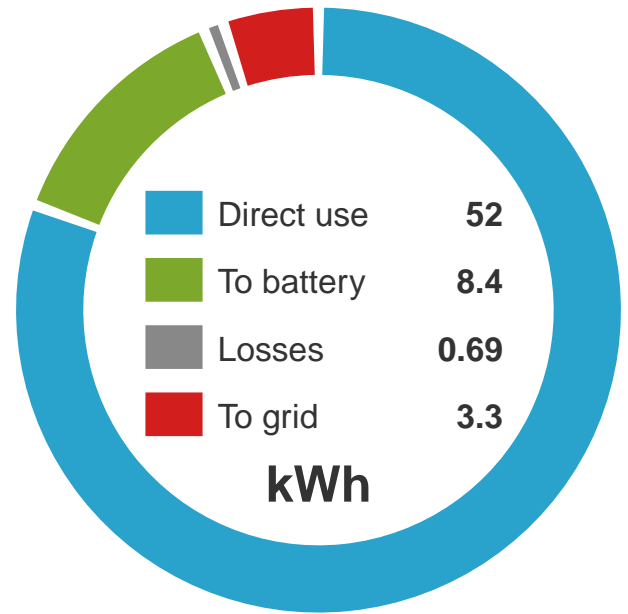
60% (13645 kWh) of the electricity generated is expected to be used directly in the property. 12% (2761 kWh) is directed to the battery for later use, although 208 kWh of this is lost during battery charging and discharging. The remaining generation (6280 kWh, or 28% of the total) is exported to the grid.

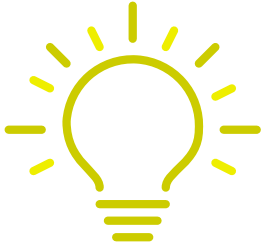




# Daily generation

This graph shows the modelled profile of electricity generated by the PV array on a selected day (March 27th). On this day the PV system is expected to generate 64 kWh. Of this, 51.6 kWh (81%) is used directly in the property, 9.1 kWh (14%) is stored in the battery for later re-use, and 3.3 kWh (5%) is exported to the grid.

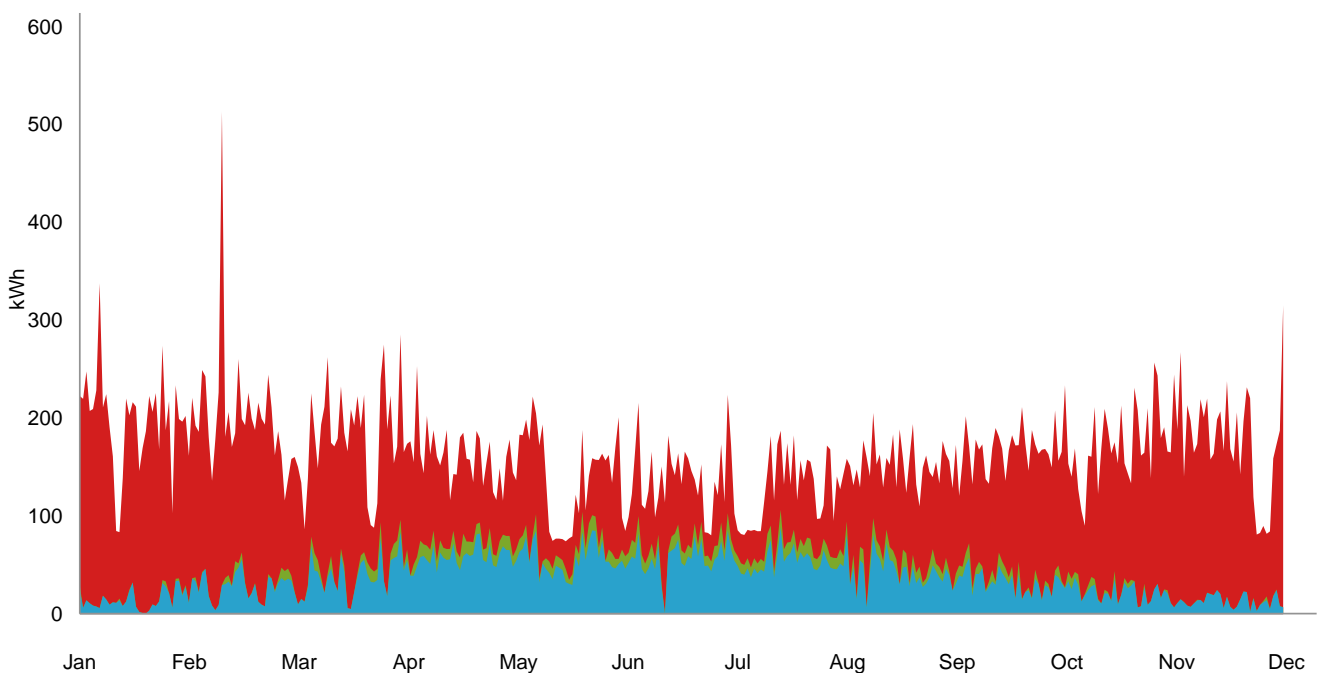
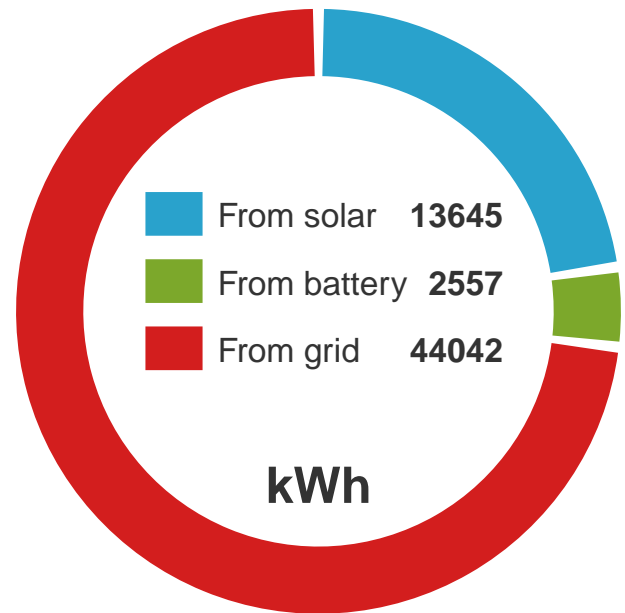


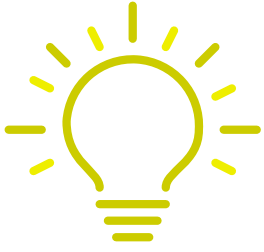


# Yearly consumption

The property is expected to consume 60000kWh of electricity each year. Around 23% of this (13645 kWh) is expected to be supplied directly by the solar array. Another 4% (2557 kWh) is supplied from the storage battery. The remaining 73% (44042 kWh) is supplied from the grid.

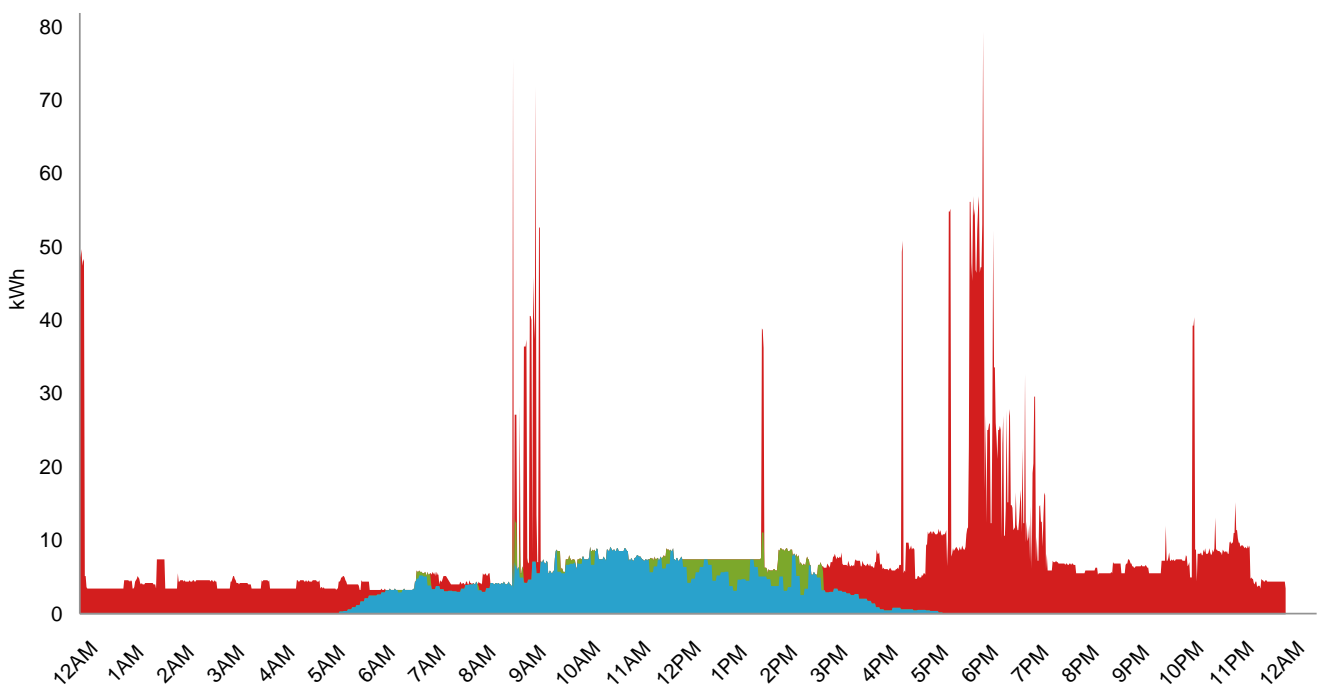
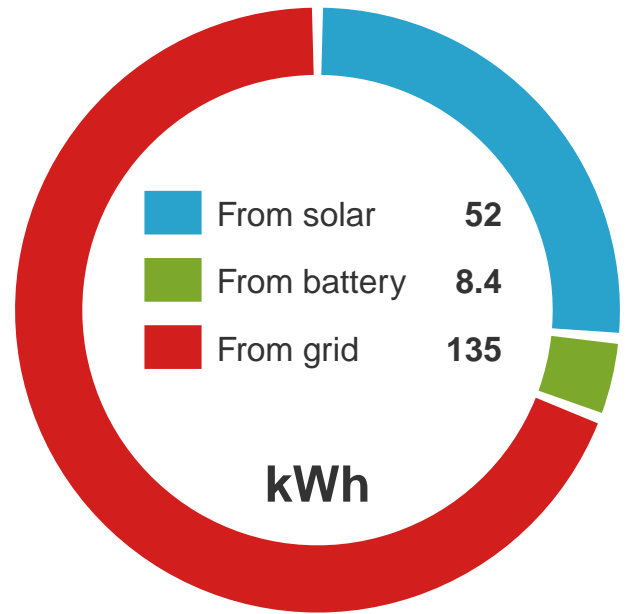
Overall, 27% (16202 kWh) of the electricity used in the property is expected to be supplied by the solar array and battery storage system. Without battery storage it would be 23% (13645 kWh).

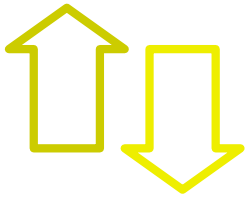




# Daily consumption

This graph shows modelled consumption data over the course of the selected day (March 27th). Total electricity consumption on this day was 194.8 kWh, of which 51.6 kWh (26%) is expected to be supplied directly by the solar array, and a further 8.4 kWh (4%) drawn from the battery storage system. The remaining 134.8 kWh (69%) is imported from the grid.

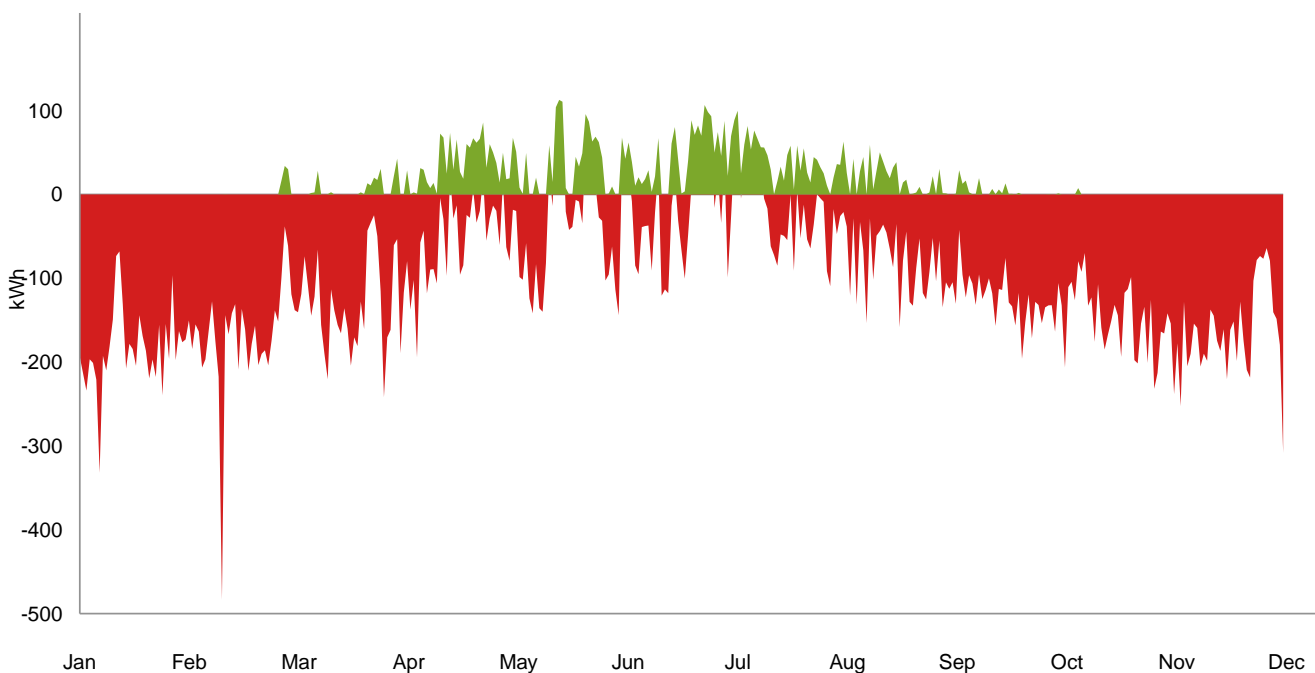
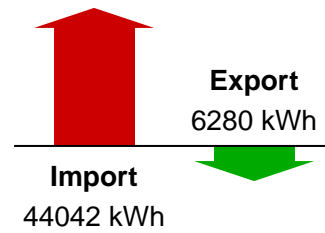


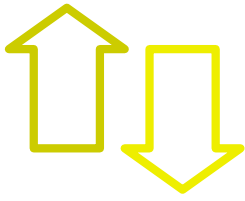


# Yearly import and export

This graph shows modelled profiles of electricity imported and exported to and from the grid over the course of a year. The red area above the horizontal axis represents imported electricity, and the green area beneath the axis exported electricity.

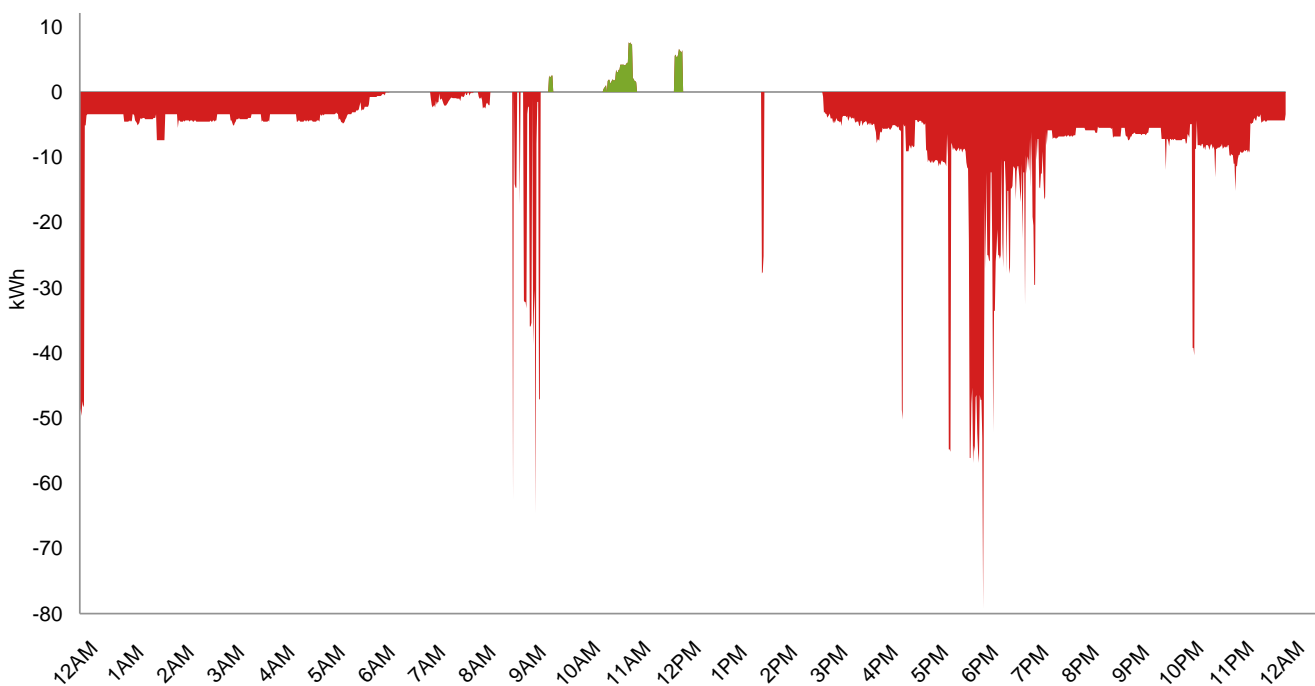
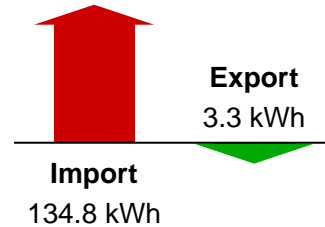
Over the course of the year, a total of 44042 kWh is expected to be imported by the property, and 6280 kWh exported back to the grid.

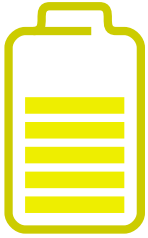




# Daily import and export

This graph shows the modelled import and export of electricity over a selected day (March 27th). On this day 134.80 kWh is expected to be imported from the grid, and 3.3 kWh exported. At times when no import or export is shown the battery storage system is charging or discharging.





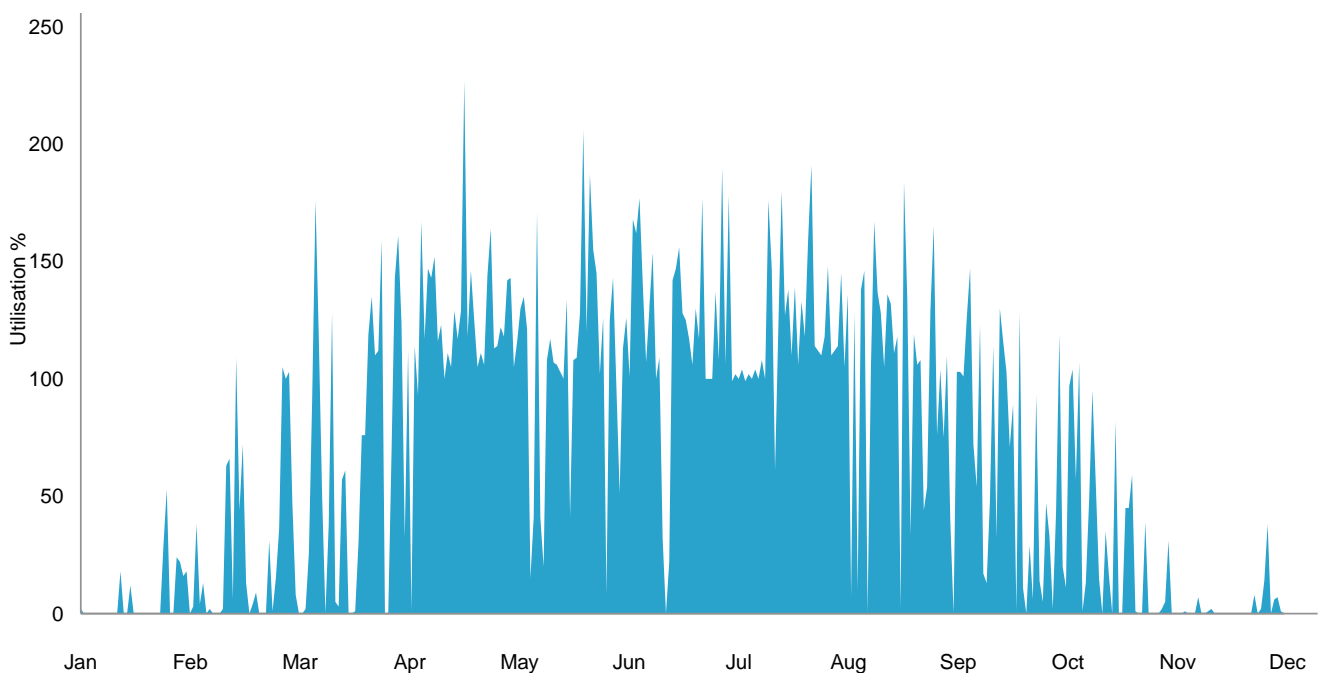
# Yearly battery utilisation

The graph shows the modelled utilisation of the battery over the course of the year - the fraction of the available battery capacity that is actually charged and discharged each day. Utilisation of over 100% is possible at times where a battery is charged and discharged more than once during a day.

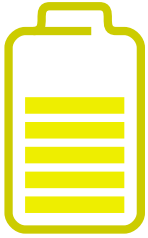
Low battery utilisation can be due to either insufficient spare PV generation to charge the battery (often the case in winter, or on cloudy days), or because loads are small overnight and the battery does not fully discharge.

Average battery utilisation

69%





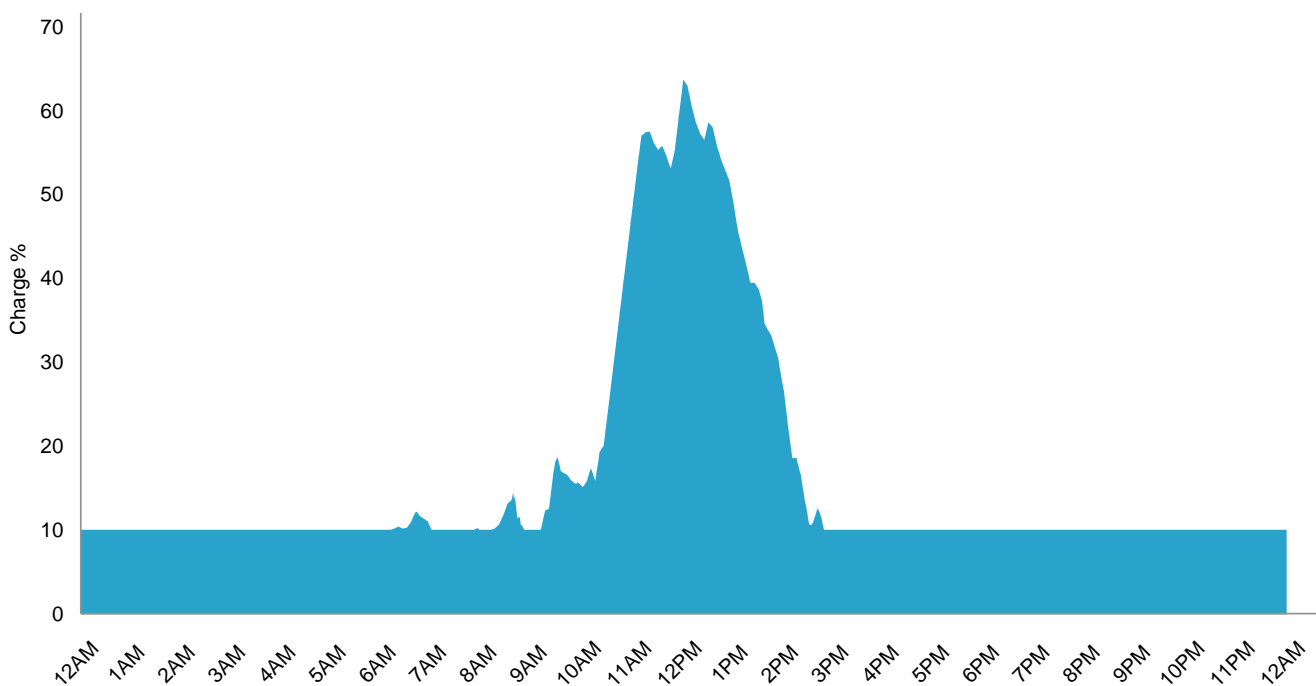


# Daily battery utilisation

The state of charge of the battery over a selected day (March 27th) is shown in the graph below. The battery discharges overnight or when there is heavy demand during the day, and charges when there is excess solar PV generation during the day. On this day, 83% of the battery capacity was utilised.

Average battery utilisation

83%

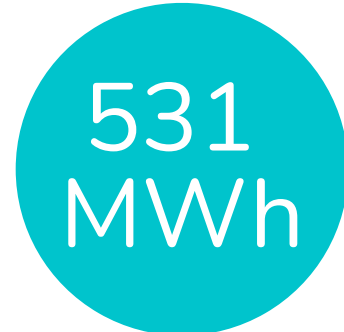




# Financial

## Generation

The system is expected to generate 22607 kWh per year initially, decreasing gradually as the solar cells degrade. Over the 25 year term of this financial projection the total generation is expected to be 531198 kWh, of which 382958 kWh will be consumed on site and 148240 kWh exported.



## Payback

After adjusting projected costs and benefits for inflation, and applying a discount rate of 4%, the initial system cost of £59,892.15 is expected to be recouped after 6 years.



## Net Present Value

The total present value of future benefits and costs, using a discount rate of 4% per year, is £284,692.36. The cost of the PV system is £59,892.15. The net present value of the project is therefore £224,800.21. A positive net present value is a good indication that the project is financially worthwhile.



## IRR

The Internal Rate of Return is a useful measure for comparing the relative profitability of investments.



## Disclaimer

Our financial model calculates the benefits of a solar PV installation (such as savings in electricity, or payments for exported electricity) and costs (the initial purchase cost, and any future maintenance costs if entered), over the projected lifespan of the system. Values are corrected for inflation, system degradation, and discount rate - a measure that accounts for the fact that a promise of a monetary sum in the distant future is usually considered less valuable than the promise of the same sum in the near future.

A model is only as accurate as the assumptions it makes. You should consider whether the values chosen are appropriate for your situation. There are many variables that dictate the financial return of a solar installation and we cannot forecast how they may change in the future. This financial projection shows a likely scenario for future financial returns. Actual returns may vary significantly from this forecast.

## Assumptions

Inflation rate	2%
Cost of electricity	£0.576 /kWh
	increases at 4% above inflation per year
System size	24.8 kWp
	degrades at 0.5% per year
Discount rate	4%
Projection length	25 years

## Income and savings

The projected income from the system over the project lifetime in payments for generated and exported electricity, along with electricity savings, are shown in the table and graph below.

These figures assume an inflation rate of 2 percent.

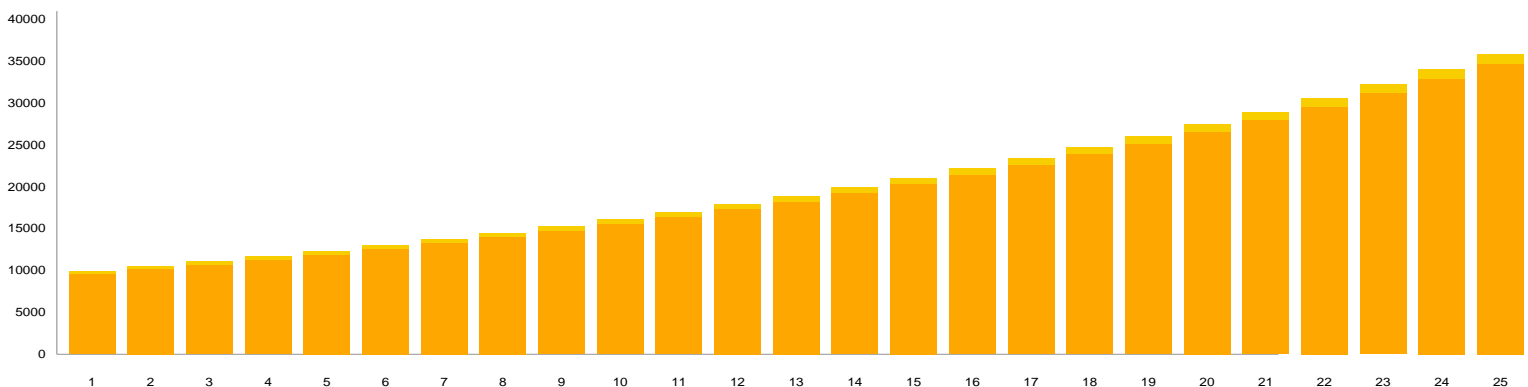
	Export payments	Electricity savings	Total
Year 1	324	9645	9969
Year 2	342	10173	10515
Year 3	361	10729	11090
Year 4	380	11316	11696
Year 5	401	11935	12336
Year 6	423	12588	13011
Year 7	446	13276	13723
Year 8	471	14003	14473
Year 9	496	14769	15265
Year 10	523	15577	16100
Year 11	552	16429	16981
Year 12	582	17327	17909
Year 13	614	18275	18889
Year 14	648	19275	19922
Year 15	683	20329	21012
Year 16	720	21441	22161
Year 17	760	22614	23374
Year 18	801	23851	24652
Year 19	845	25155	26001
Year 20	892	26531	27423
Year 21	940	27983	28923
Year 22	992	29513	30505
Year 23	1046	31128	32174
Year 24	1103	32830	33934
Year 25	1164	34626	35790

£16509

Total Export Payments  
over 25 years

£49131  
7

Electricity savings  
over 25 years



## The bottom line

The table and graph below show the discounted costs for the project (including the initial capital required for the installation), against the total discounted benefits from income and savings on electricity bills.

The system pays for itself in 6 years.

	Discounted benefits	Cumulative benefits	Discounted costs	Cumulative costs	Cashflow
Year 1	9770	9770	0	59892	-50122
Year 2	9892	19662	0	59892	-40230
Year 3	10016	29678	0	59892	-30214
Year 4	10141	39819	0	59892	-20073
Year 5	10268	50087	0	59892	-9805
Year 6	10397	60484	0	59892	592
Year 7	10527	71010	0	59892	11118
Year 8	10658	81669	0	59892	21777
Year 9	10792	92461	0	59892	32568
Year 10	10927	103387	0	59892	43495
Year 11	11063	114451	0	59892	54559
Year 12	11202	125653	0	59892	65760
Year 13	11342	136995	0	59892	77102
Year 14	11484	148479	0	59892	88586
Year 15	11628	160106	0	59892	100214
Year 16	11773	171879	0	59892	111987
Year 17	11920	183800	0	59892	123908
Year 18	12070	195869	0	59892	135977
Year 19	12221	208090	0	59892	148198
Year 20	12374	220463	0	59892	160571
Year 21	12528	232992	0	59892	173100
Year 22	12685	245677	0	59892	185785
Year 23	12844	258521	0	59892	198629
Year 24	13004	271525	0	59892	211633
Year 25	13167	284692	0	59892	224800

