



# Proposal

## Laighpark, Milngavie

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Quote No	LES-EST-2024-727



We are delighted to provide Initial designs for this project. Please see below the contents of our proposal.

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# 1. System and Equipment Summary



System Specification	PV Generator Output	31.70 kWp
	PV Generator Energy (AC grid)	TBC kWh/Year
Mounting System	Manufacturer	Van Der Valk/Renusol
	Type	Pro+/VS+
	Installation Angle	10/TBC °
	Orientation	TBC °
	Warranty Period	10 Years
PV Modules	Manufacturer	JA Solar
	Type	425 W
	Quantity	84
	Connector Type	MC4
	Defect Warranty Period	25 Years
	Power Warranty	30 Years
Inverter	Manufacturer	Solaredge
	Type	12/7/6 kW
	Quantity	3
	G98/99 Details	G99 Integrated
	Warranty Period	12 Years

# 2. Quotation

Total Price (excluding VAT)	£41,712.00
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### 3. Inclusions and Exclusions



	Installation Responsibilities/ Requirements	Low Energy Services	Others	Client
Pre-Construction	PVSOL Design of Solar PV System	✓		
	Planning Permission	N/A		
	Planning Costs	N/A		
	Grid Application to DNO	✓		
	DNO Costs			✓
	Structural Sign Off	✓		
	Snow and Wind Load Report	✓		
	Building Warrant/Notice	✓		
	Building Warrant costs			✓
Construction	Supply and Installation of Solar PV System	✓		
	Integration with Lightning Protection System	✓		
	DC Containment External	✓		
	DC Containment Internal	✓		
	DC Cabling	✓		
	Cable Entry	✓		
	AC Containment	✓		
	AC Cabling	✓		
	AC Provision of Point of Connection	✓		
	DC Surge Protection	✓		
	AC Surge Protection	✓		
	Data Cabling	N/A		
	Wifi access			✓
	Receiving materials, Offloading	✓		
	Lifting Materials to Installation Area	✓		
	Safe Working Environment Including Edge Protection, Scaffolding, Platforms, or other Access Equipment	✓		
	Site Welfare	✓		
Waste removal	✓			
Post-Install	O&M Manual	✓		
	Client Demonstration	✓		
Other	Fire Alarm Interface	N/A		
	Fireman's Switch	N/A		
	Bird Netting	N/A		
	Remote Display	N/A		



## 4. Overview



### 4.1 Project Brief

The work detailed within this proposal covers the supply and installation of the Solar PV systems. JA Solar PV modules mounted on a Van Der Valk Pro+ and Renusol VS+ systems will be used to create the array designs for this property. The Solar PV system is a grid tied system that will connect to the internal electricity supply as well as the external power grid.

### 4.2 Site and Project Description

The proposed site for the Solar PV installation will be the roofs of The Milngavie Golf Course being fed by systems connected to string inverters, connected to the landlord supply.

### 4.3 MCS requirements

The complete installation shall be installed, tested and commissioned in accordance with the following standards:

1. CDM requirements 2015
2. BS7671 IEE wiring Regulations 18th edition
3. Photovoltaics in Buildings-Guide to the installation of PV systems 3rd Edition 2013
4. MIS 3002, Solar Photovoltaic Standard
5. BRE Digest 489 Wind loads on roof-based photovoltaic systems
6. BRE Digest 495 Mechanical installation of roof mounted photovoltaic systems
7. Health and Safety at Work Regulations
8. B.R.E IET Code of Practice
9. The Building Regulations 2010
10. SAP 2012
11. ENA G98 Regulations
12. EN 1991 Eurocode1- Actions on structures
13. BS62305 Lightning Protection

The above standards are not exhaustive and all applicable national and international standards shall apply.





## 4.4 Relevant Regulations and standards

As an experienced and qualified specialist in Solar PV we propose:

1. The installation of the mounting system that secures the PV modules safely and securely to the structure of the building in line with the manufacturer's recommendations as well as those of the roofing manufacturer.
2. The supply and installation of the DC cabling and all PV modules detailed in the design.
3. The supply, installation and connection of all inverters.
4. The supply and installation of all AC and DC isolators.
5. The installation of warning signs, labels, and schematic.
6. Liaison with the witness appointed by the Distribution Network Operator (DNO) in order to safely commission if applicable.
7. Testing and commissioning of the complete system.
8. Provide detailed operation and maintenance documentation including as fitted drawings.
9. Demonstration of the complete system to the client.

## 5. Equipment Specification and Installation

### 5.1 Mounting System

Van Der Valk Pro+ and Renusol VS+ Mounting systems will be utilized for this installation, snow and wind load calculations will be signed off by our structural engineer.

### 5.2 PV Modules

The PV Modules used in this design are JA Solar 425W, rigid panel type with monocrystalline construction, insulated rear panel and glass front with anodized aluminium frame. The panel carries a CE mark, is MCS accredited and complies with BSEN621215. The Panel has a standard 25-year product warranty and 30-year linear performance warranty.





### 5.3 Inverter

Solaredge 12.5kW And 6 and 7 kW 3 phase Inverters has been selected; these are ENA accredited, comply with ENA G99 and come with a 12-year warranty, location to be confirmed.

### 5.4 DC Electrical system

All ratings of D.C. components will be selected based upon the maximum voltage and current of the PV array. Considering the parameters of the series/parallel connected PV modules in the array and the individual PV modules in the array. D.C. components will be rated, as a minimum, at:

- Voltage:  $V_{oc} \times 1.20$
- Current:  $I_{sc} \times 1.25$

DC cabling will be run on containment installed on the mounting frame and/or rubber strut mount on flat roof. Surge protection as required will be provided.

### 5.5 AC Electrical system

AC wiring and containment supplying the inverter will be installed to BS7671. Integration with LPS and surge protection as required will be provided.

### 5.6 Metering and Monitoring systems

An OFGEM approved Generation meter will record total generation and Data Loggers will be connected to the on-site Wi-Fi system, location TBC.



## 6. General design and regulatory considerations



### 6.1 Planning permission

Solar PV installations of this type will not require planning permission.

### 6.2 Grid Connection

A Grid Connection application is required for installations of this type, notification will be lodged by Low Energy Services. Costs by DNO excluded.

### 6.3 Structural Survey

Low Energy Services will provide a snow and wind load report to be signed off by the structural engineer.

### 6.4 Building Control

Systems of this type will may require notification to Building Control. Costs have been excluded.





## 7. Installation Commissioning and Handover



### 7.1 Health & Safety Considerations

The Installation of this system falls under similar health and safety considerations to most solar PV installations. There are no risks that require specific consideration. RAMS will be issued two weeks prior to installation.

### 7.2 Site Access

No special access is required to the site as existing roads will serve adequately. Care will be taken when parking vehicles.

### 7.3 System Commissioning

Testing and commissioning will be carried out in accordance with relevant standards and regulations.

The following will be tested, and documentation completed:

1. The PV array shall be suitably tested and inspected to ensure all panels are securely mounted and will tolerate expected wind loads.
2. Each panel will be individually tested to ensure it operates within the Manufactures recommendations.
3. The inverters shall be verified to ensure they are in optimum working order without faults.
4. The DC Circuits will be tested to ensure the string voltages and current are within expected parameters given the external temperature and measured irradiance.
5. The AC circuits will undergo the full array of tests as detailed in Bs7671 and GN3.

## 8. Performance

PVSOL performance data, this is based on the actual components used, following a site survey taking into account shading and orientation.

*Please note: The actual yields of the photovoltaic system can deviate from these values (if given) due to fluctuations in the weather, the efficiency of modules and inverters and other factors. These estimates have been based upon the Governments standard assessment procedure for energy rating of buildings (SAP) and are given as a guide line only. It should not be considered as a guarantee of performance*





# The Next Steps...



## About Us



We have generated more than **123,456,789 Kwh of Clean Energy.** That's enough to power more than 4 THOUSAND homes a year!



We have helped businesses reduce more than **123,456,789 Tonnes of Carbon** That's the same as planting over 3 HUNDRED THOUSAND trees!



We have helped businesses save over **£10 MILLION** by reducing their energy bills.



## About Us



**From survey and design, through to installation and maintenance, we offer turnkey green energy solutions for businesses across Scotland.**

We offer an extensive portfolio of green energy services. As well as solar panel installers and battery storage system fitters, we cover everything from energy monitoring, control strategy analysis, building heat leakage analysis, design, supply, installation and maintenance of renewable technologies to general advice on how to make your building as efficient as it can be.





# What We Can Offer



## Green Energy Consultation

We have a proven track record for delivering green energy results for businesses looking for bespoke low carbon electricity generating systems.



## Design

We work on installation projects big & small to deliver a reliable source of green energy for your business.



## Maintenance

High quality aftercare to give you peace of mind.



## Bespoke Solutions

Rather than fit a square peg through a round hole, we work with you to develop bespoke solutions that work.



## Construct

We employ all of the installation team inhouse to guarantee a hassle-free, safe and high quality installation



## Monitoring

We work on installation projects big & small to deliver a reliable source of green energy for your business.



# Why Solar?



## Reducing your impact on the environment

Solar energy has the least negative impacts on the environment in comparison to other forms of energy generation. It does not produce greenhouse gases or pollute our water supply. It does not create noise pollution and requires little in the way of maintenance compared to other green energy solutions.

## It works everywhere

With the latest in solar panel technology, as long as there is sunshine, solar energy can be captured and used. Scotland has anywhere between 1000 and 1500 hours of sunshine per year depending on where you are.

## Reducing energy bills

Generating your own electricity means that you will rely less on 'the grid'. This will translate into savings on your energy bill and if you sell unused electricity back to the grid, it can become a source of income.

## Peak times of sun matching electricity peaks

Electricity is in demand the most between 11am and 4pm. This is also when you can take the most advantage of the sun.

# What We Do



## Why choose **Low Energy Services**?



**From survey and design, through to installation and maintenance, we offer turnkey green energy solutions for domestic homes and businesses across Scotland and England.**

The quality of our installation work is incredibly important to us. We ensure that the entire installation team are in-house Low Energy Services personnel so that we can take full charge of quality control and installation fit & finish. Whether the installation is for a High Street brand or a local business, you will always find the same level of quality and attention to detail from us.

We are fully accredited for all installation work and put a keen emphasis on personnel safety and working standards.



### **Health & Safety**

0 reported incidents  
Safe Contractor Approved  
NICEIC Approved



### **We add real value**

Point 1  
Point 2  
Point 3



### **Real world experience**

X number of installations completed  
Working with Multi Chain Brands  
Experience of installations on historic & listed buildings





# Solar PV Systems



**Power your business with the energy of the sun!**

Solar Photovoltaic (PV) modules harness energy from the sun and generate this into electricity for use in and around your building.

Contrary to what you may think, Solar Panels do not require direct sunlight to generate electricity but rather they depend on daylight to produce electricity.

This means that a solar panel system can provide energy all year around, even on a cloudy day in Scotland.





# Battery Storage Systems



**Store your energy captured by solar panels for when you need it most**

Battery Storage Systems are an energy storage system for businesses that want to take control of their energy supply and reduce reliance on the grid to lower their energy bills.

Battery Storage Systems enables energy captured and generated by solar panels to be stored and utilised when required. This offers more flexibility for your business over its electricity usage as it allows you to use much more of your clean, self-generated energy rather than pay for electricity from the national grid that is generated by fossil fuels.



# Case Studies



# Top Golf

**The new Top Golf Driving Range in Glasgow has already become one of the top premier entertainment destinations in the city.**

With climate controlled hitting bays and HDTVs as well as sports bar and restaurant facilities, the new venue located in Rutherglen is easy to spot sited right next to the M74 motorway.

What is less easy to spot is the 51 Solar Panels that we have fitted to the roof of the new venue.

Low Energy Services were contracted to install and project manage the new solar panel system for Top Golf in Glasgow to help with the facilities energy targets.

The new solar panel system is made up of 51 410w Canadian Solar branded solar panel. The entire solar panel set up is mounted onto a Van der Valk mounting system in three arrays that allow the layout to curve with the buildings architecture.

In total, the new solar panel system will help the Top Golf facility to produce over 18,000 kWh of energy every year. This will help to significantly reduce their CO2 output and reduce their electrical energy bills.

The entire system was installed and is managed by Low Energy Services and our in-house team of engineers.





# Burger King

## Low Energy Services were responsible for the installation of a new solar panel installation at one of Burger Kings newest Aberdeen locations.

The new solar panel install includes 28 solar panels with each rated at 380w. These new solar panels were fitted onto a ballasted East/West orientation Van Der Valk system and connected to a new Solar Edge Optimiser with a 10kW three phase inverter.

The entire system will produce an expected 8460kwh per year. This will save the company what equates to 2.38 tonnes of CO2 – the equivalent of 109 trees planted!!!

As with every project that we work on that helps to tackle climate change, we are delighted to have been part of this project that will help Burger King to reduce their CO2 output while reducing their electricity bills every single month.





**Low Energy Services**

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