

THE COMPLETE BUYER'S GUIDE TO SOLAR FOR SOUTH AFRICA

BY THE ENGINEERING OVERLORDS AT SOLARCHECK

solarcheck

[SOLAR CALCULATOR](#)

[SOLAR SURVEY](#)

T +27 21 012 5320
WHATSAPP: +27 82 043 3977
E info@solarcheck.co.za

ABOUT THIS GUIDE

There are more solar installers in SOUTH AFRICA than Gupta enablers. How could the common bloke (or madam) navigate through the baloney and get **reliable and renewable** power sources from TRUSTED INSTALLERS?

Fear not! The mad scientists at SolarCheck has your back. This guide will give you all the **tools** you need to give rising electricity prices and **load-shedding** the old middle finger.

[SOLAR CALCULATOR](#)

[SOLAR SURVEY](#)

T +27 21 012 5320
WHATSAPP: +27 82 043 3977
E info@solarcheck.co.za

THE FOUR PITFALLS

Costs

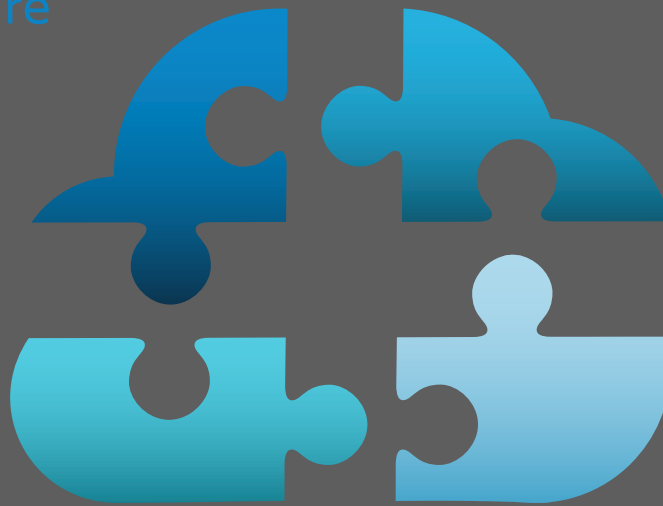


We make sure
your quotes
are fair



Installers

It's crucial to
get the best
installers



Design



You need only
the best
equipment



Planning

From idea to
realisation

[SOLAR CALCULATOR](#)

[SOLAR SURVEY](#)

T +27 21 012 5320 | [WHATSAPP: +27 82 043 3977](#) | [E info@solarcheck.co.za](mailto:info@solarcheck.co.za)

TABLE OF CONTENTS

1. Introduction	5
1.1. This guide will help you:	5
2. Benefits of Solar	6
3. Economics of Solar	7
3.1. So, what does this stuff cost?	7
3.2. Evaluating your energy bill.	8
3.3. Comparing QUOTEs	9
3.4. Developing a bankable Solar Solution	9
4. Some interesting mumbo-jumbo	10
4.1. Which provinces boast the most rooftop solar	10
4.2. Provinces with best solar irradiation	10
5. Choosing the right contractor is critical	11
6. Regulation – Do you have to apply for a solar installation?	13
7. Downloads	14
7.1. Cape Town	14
7.2. Johannesburg	14
7.3. General	14
8. Glossary of Terms	15

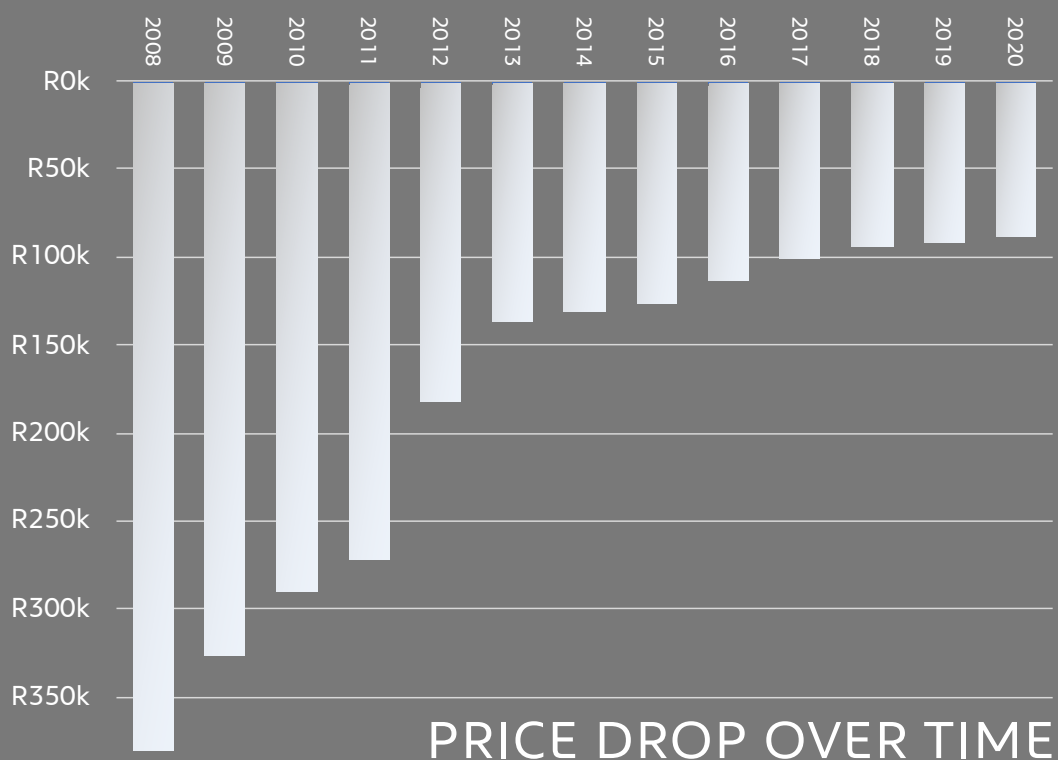
THE SOLAR BUYER'S GUIDE FOR SA

1. INTRODUCTION

You downloaded this Guide because you're in the market for a solution to hedge against load-shedding, or to mitigate against rising electricity tariffs. What complicates your search for a solution is the tense relationship between technology, quality, and the market in South Africa. **Who** do you call? **How** large should the system be? **What** would be a fair price?

1.1. THIS GUIDE WILL HELP YOU:

- get hold of the **right people**,
- help you become informed regarding **system sizing**,
- give you a rough idea of what a typical system would **cost**,
- highlight some potential **pitfalls**



2. BENEFITS OF SOLAR

Do you still need to be convinced that solar is the way to go? Well, perhaps you don't buy into the climate-change hysteria. Fair enough. But consider this: South Africa is blessed with incredible **year-round renewable resources**, especially solar irradiance. Furthermore, we have a **failing power utility** that not

only provides unreliable and irregular electricity but is likely to **increase tariffs** dramatically over the next decade. You don't have to be a bunny-hugger to appreciate the value of going solar.

Also, just check out these beautiful and informative, well-designed squares!

LOWER ELECTRICITY COSTS

- Generate your own electricity onsite
- Reduce reliance on more expensive grid energy
- Reduce your operating expenses
- Shield your business from unpredictable energy prices

IMPROVE RELIABILITY

- The sun provides a consistent source of power, even on cloudy/rainy days
- Forecast operating expenses
- Install a Storage solution and use stored Solar energy when the grid is down, increasing your site resilience

CREATE REVENUE

- Solar can provide a source of revenue from any excess power generated
- Monetise your energy
- Solar can be used as part of a more comprehensive energy strategy

UNLOCK VALUE

FROM UNUSED PROPERTY ASSETS

Installing Solar at your facility helps you unlock value on your property, such as your:

- Roof
- Empty land space
- Get most out of unused

3. ECONOMICS OF SOLAR

3.1.S0, WHAT DOES THIS STUFF COST?

According to South African-based solar power specialist company, LightGrid Energy, the cost of a residential solar power installation can range from around R65 000 to R210 000 for a normal solar PV grid-tied system, and R160 000 to R460 000 for an off-grid system, or grid-tied system

THE RECENT DROP IN PRICES HAS MADE THE RETURN ON INVESTMENT FOR SOLAR MUCH MORE FEASIBLE

that includes battery backup. These costs include equipment, installation and electrical certificates. This range is dependent on:

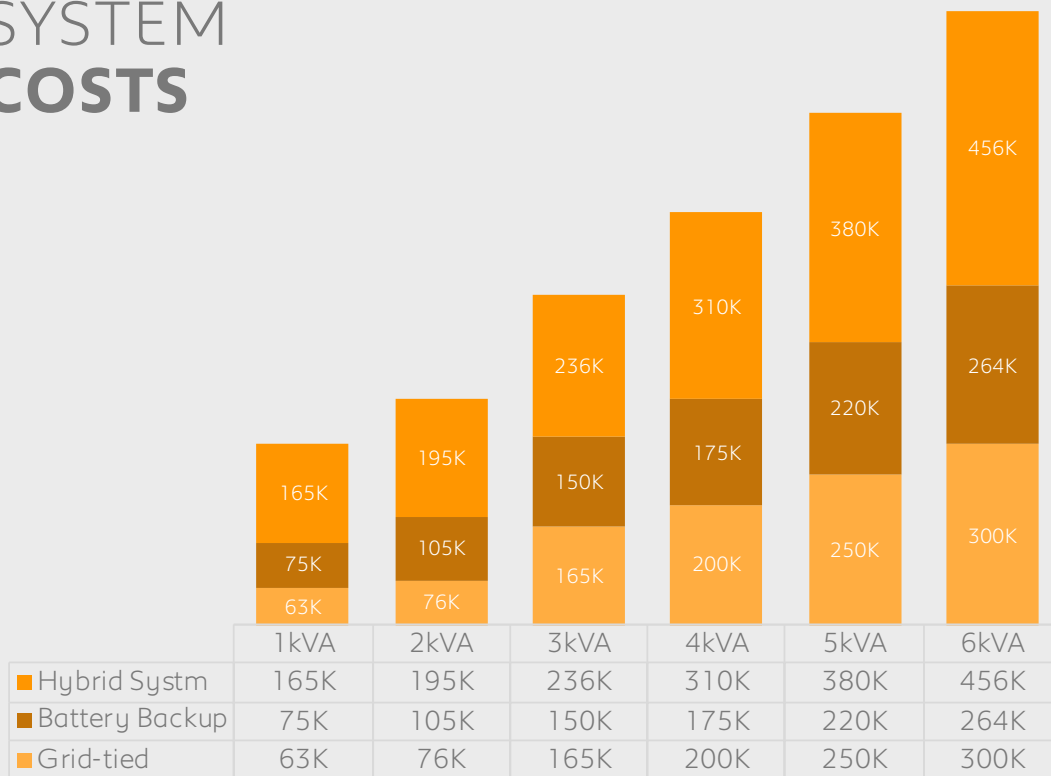
- the size of the house,
- amount of sunshine your site receives
- the electrical layout (single- or 3-phase),
- and the end-user's specific requirements.

(Skip the following mumbo-jumbo and go to the next page for a nice chart)

Your power requirement depends largely on your electricity usage and number of appliances. Every household is different, and there is no one-size-fits-all solution. But generally, heat generating appliances such as geysers, stoves, ovens and heaters can dramatically increase the solar requirement. It's therefore important to implement an energy audit before requesting quotes for a solar system (see section 5 for more on energy audits).

A bigger solar power system, such as a 10kW system, can allow for a geyser to run - if it is put on a timer so that it switches off automatically once the water reaches the right temperature. In terms of heaters, stoves and ovens, gas alternatives are good, reliable solutions.

SYSTEM COSTS



3.2. EVALUATING YOUR ENERGY BILL.

The first part of our Solar evaluation process is to analyse your energy consumption and spend over the course of the past several electricity bills from the utility company. This is a very important exercise and should typically be implemented by either your local electrician, or the solar company that will be responsible for the installation. Your bill may also mislead you into thinking you may only require a small system. That's why you need to speak to the right contractor. Many suppliers will simply offer you a brute-force system that is sure to cover your energy needs. But this can be unnecessarily over-specified and costly. Again, getting hold of a trusted local solar installer is key. This information is used to design a bankable Solar system that will deliver electricity savings by offsetting a certain percentage of the electricity you're drawing from the grid with clean, efficient Solar power instead.

THE RECENT DROP IN PRICES HAS MADE THE RETURN ON INVESTMENT FOR SOLAR MUCH MORE FEASIBLE

3.3. COMPARING QUOTES

So, you've done your homework and asked multiple companies to furnish you quotes. Now all you have to do is compare them, right? Well, it turns out that's not as easy as you think.

When you receive multiple solar energy quotes from installers, these are but a few of the things you have to consider:

- equipment choices,
- financing options,
- solar company reviews,
- system sizing
- how warranties are honoured
- and last but not least - cost

By comparing multiple quotes for solar energy systems from installers in the SolarCheck Marketplace, you can save not only money and time, but avoid unnecessary stress. Installers on the SolarCheck platform know that their information is being standardised and reviewed side-by-side alongside quotes from other solar companies, and this often encourages them to provide a fair price and the best terms possible for your solar energy system. Solar aggregators or consultants will complete this due diligence on your behalf.

3.4. DEVELOPING A BANKABLE SOLAR SOLUTION

After the analysis of your site viability, your utility bill, and energy usage, our approved system designers and engineers will send you a tailored proposal that will indicate estimated system production, the system specification, and all the components that comprise the solution.

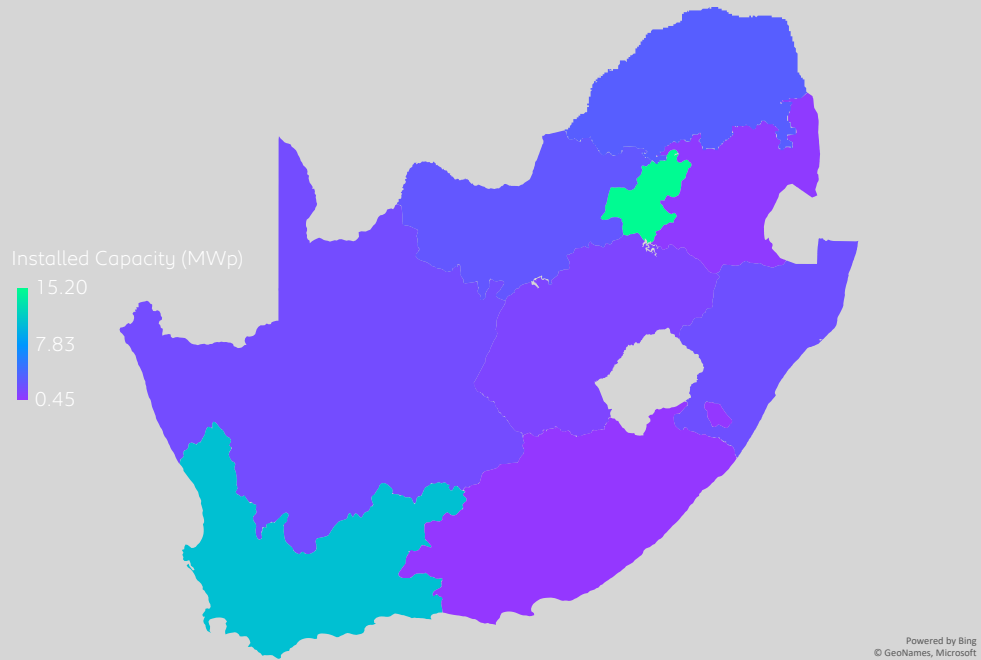
At this stage, you should now be able to make an informed decision, based on the predicated solar energy production, and the accompanying savings. Typically, the proposal will include charts and tables that describe the estimated payback period for the system, and annual production.

But there is a trap! One of the biggest mistakes customers make is that they allow installers to over-specify the system size. That often means that you end up not using all the solar power that is produced. And even if you are allowed to feed some energy back into the grid, you are likely to earn credits for that at a costly premium.

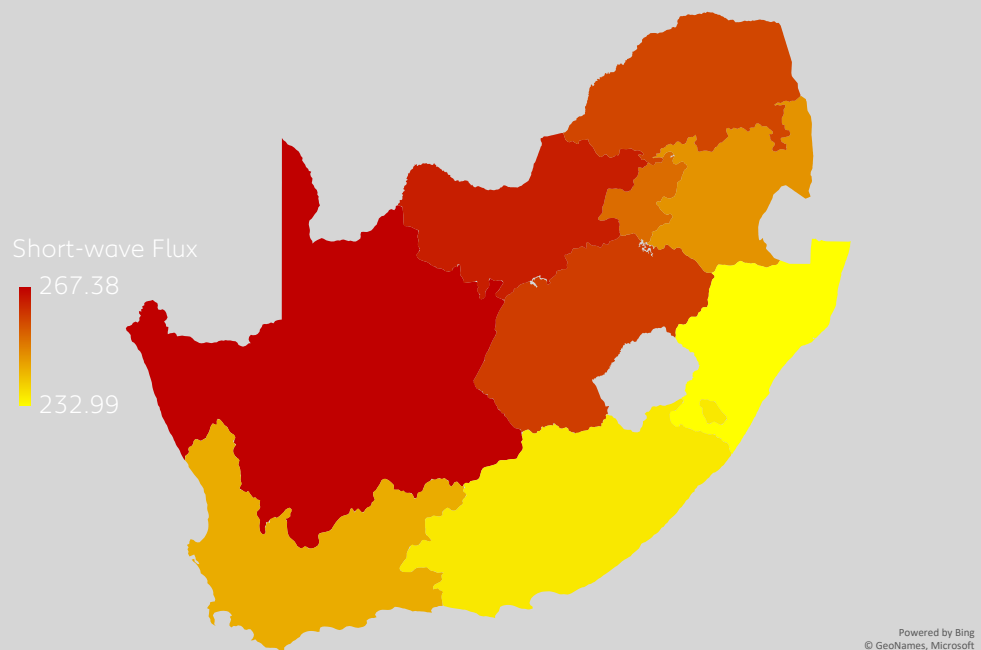
THIS IS
A TRAP!

4. SOME INTERESTING MUMBO-JUMBO

4.1. WHICH PROVINCES BOAST THE MOST ROOFTOP SOLAR



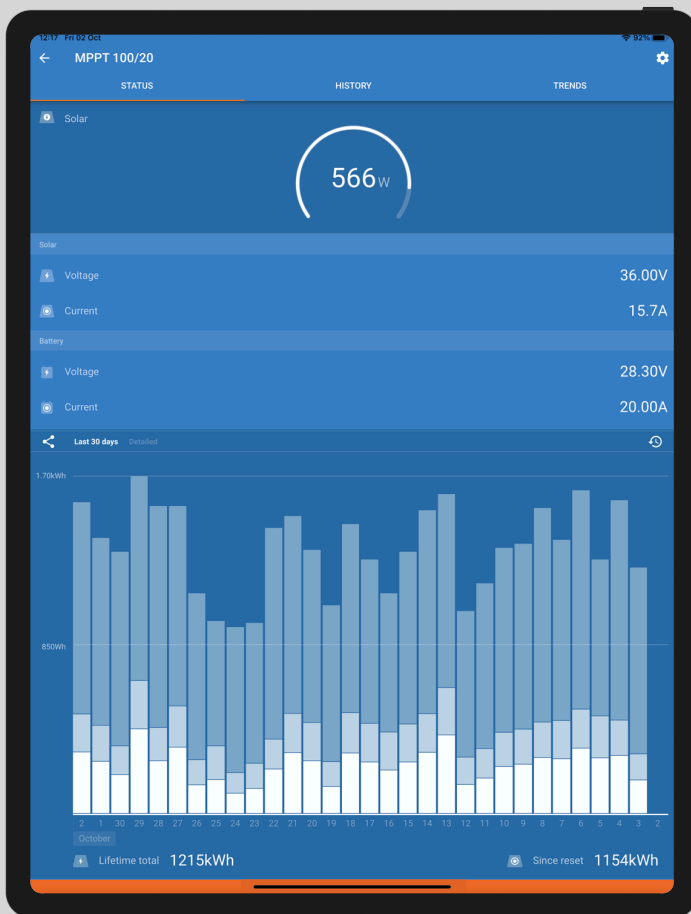
4.2. PROVINCES WITH BEST SOLAR IRRADIATION



5. CHOOSING THE RIGHT CONTRACTOR IS CRITICAL

By far the most important factor when exploring solar solutions is choosing a trusted installer. Solar contractors in South Africa typically offer turnkey solutions, that include the site assessment, the system design, equipment procurement, physical installation, and engineering sign-off. Some installers will even assist in local regulatory applications for registering with the local municipality or utility. It is therefore critical that the customer gets the right people from the start.

Here are some of the things to look for in a good solar installer:



Do they offer Workmanship Warranties

These warranties relate to the work of designing and installing the solar energy system. They can range anything from 1 to 5 years. It should be noted that separate contracts cover the operation and maintenance of your solar system.

Do they offer a Turnkey Solution

Selective use of sub-contractors and effective oversight. Many solar installers are not able to complete a solar system installation in-house, and often needs to include subcontractors. This is not always a bad thing, since subcontractors usually attend to highly specialised parts of the scope. For example, if

there is a need to modify the electrical distribution board, and electrical contractor is the best bet. Furthermore, an engineering sign-off is often handled by and engineering firm that specialises in just that. To make sure you have a good understanding of what is quoted for, and you have a third-party that can exercise good oversight, we recommend the use of a solar aggregator or consultant who looks after the end-user's needs, such as SolarCheck.

System design and specification | Superior installers are guides and advisors. It's important to select an installer who does quality work, but not all installers are able to design and specify system size properly. The tendency in South Africa is to over-size the system. This make sense – they are incentivised to make sure they don't have to return to problems relating to a shortage of solar array capacity, or inverter power output. But this is not always efficient, nor is it the best way to spend your hard-earned Rands. A specialised solar consultant will make sure that a proper energy audit is done beforehand to ensure that the system is sized correctly. Such an audit will also reveal further energy-saving strategies, such as converting cooking appliances to gas, or replacing light bulbs with LEDs.

It is highly recommended to use a solar aggregator company, or vetting company, to make sure you get the best recommended installer that is local to your area is chosen for your project.

When choosing an installer, these are the things you need to look for:

- License & Insurance
- Reviews and References
- Review warranty information and ownership
- Review what maintenance plans and after-sales service they provide

If this complicated process troubles you, consider using a solar vetting company, like SolarCheck. SolarCheck will hook you up with vetted and trusted installers local to your area.

6. REGULATION – DO YOU HAVE TO APPLY FOR A SOLAR INSTALLATION?

Unfortunately, yes. Whether you install a grid-tied system, with or without batteries, or an off-grid system, you will have to apply for SSEG (Small Scale Embedded Generation) authorisation from your utility. Many solar installers offer to manage this whole process and will even do an engineering sign-off in-house.

Here's a typical list of what you need to provide in your application:

- Energy & Climate Change Directorate | GEN/EMB **Application Form**
- **Preliminary design:** a simple circuit diagram showing major system components and point of common coupling (PCC) must be provided.
- **Earthing arrangement:** this must be in accordance to SANS 10142-1. Earthing requirements for common earthing systems are described in NRS 097-2-1.
- Various **electrical parameters** of the system: these sections require information on the electrical specifications of the SSEG system. Not all sections of the GEN/EMB application form are applicable to all SSEG types.
- Proposed peak power **generation output:** maximum power expected to be generated must be detailed in the application form. This must be within the maximum power limits given earlier in this document.
- **Engineering Sign-off;** as detailed on page 11, the final installed SSEG system must be signed off on commissioning as complying with the City's requirements by a professional engineer or technologist registered with ECSA

SOLAR CALCULATOR

SOLAR SURVEY

T +27 21 012 5320
WHATSAPP: +27 82 043 3977
E info@solarcheck.co.za

7. DOWNLOADS

7.1. CAPE TOWN

- ENERGY & CLIMATE CHANGE DIRECTORATE; GEN/EMB - [download](#)
- APPROVED PHOTOVOLTAIC INVERTS LIST - [download](#)
- CUSTOMER CONNECTION INFORMATION GUIDE - [download](#)
- TARIFFS - [download](#)
- REQUIREMENTS FOR SMALL SCALE EMBEDDED GENERATION - [download](#)

7.2. JOHANNESBURG

- SSEG GUIDELINES - [download](#)
- TARIFFS - [download](#)
- APPLICATION FOR THE CONNECTION OF SOLAR PV EMBEDDED GENERATION

7.3. GENERAL

- Status of Small Scale Embedded Generation (SSEG) In South African Municipalities - [download](#)

8. GLOSSARY OF TERMS

AC electricity – Alternating current electricity.

Capital Sale – A form of funding your Solar system where you purchase the system with capital outlay, resulting in maximum ROI and payback from your Solar investment.

Carbon dioxide (CO₂) – An odourless greenhouse gas which is harmful to the environment.

Carbon footprint – The amount of carbon dioxide and other carbon compounds emitted as a result of using fossil fuels.

Consumption – The amount of electricity your business uses.

Crystalline silicon technology – The most widely used, efficient and reliable photovoltaic technology available.

Demand charges – Utility charges based upon your highest peak interval of usage in any month.

DC electricity – Direct current electricity. Distribution board – A component of an electricity supply system that divides an electrical power feed into subsidiary circuits and protects each circuit with a breaker.

Generation meter – A device that measures the amount of AC electricity that has been created and then passes it to the distribution board.

Greenhouse gases – Gases which contribute to the greenhouse effect by trapping infrared radiation.

Grid electricity – Electricity delivered to customers by the electric power transmission network (see “National Grid”).

Ground mount Solar installation – Solar panels are installed in the ground either onsite or at another location.

Installation plan – A plan developed by your Project Manager to install your system without disruption to your operations.

Inverters – Devices installed with your Solar panels that convert DC

electricity into AC electricity for your business to use.

Inverter warranty – A product warranty provided by the manufacturer, covering the inverters for 5 years (extended warranties are available).

kW – Kilowatt.

kWh – Kilowatt hour.

Monitoring – A service provided by Centrica Business Solutions in which our in-house teams monitor your system performance to ensure your Solar system is running smoothly and address any issues promptly.

Mounting system – Equipment used to fix Solar panels onto their installed surface.

Mounting system warranty – A product warranty provided by the manufacturer, covering the mounting system for 10 years.

MW – Megawatt.

MWh – Megawatt hour.

National Grid – A high-voltage electric power transmission network for delivering electricity to customers in the UK.

O&M – Operations & Maintenance. LightGrid Energy offers O&M packages tailored to your site needs.

PV – Photovoltaic.

Panel warranty – A product warranty provided by the manufacturer, covering the Solar panels for 10 years.

Payback – A calculation that estimates how long it will take for you to “break even” on your Solar investment.

Performance guarantee – A guarantee provided by the Solar panel manufacturer that ensures the panels will perform and degrade as designed by the manufacturer.

Power Purchase Agreement (PPA) – A form of funding your Solar system where you purchase the electricity generated from the system installed at your site at a set kWh price for the term of the contract.

Product warranty – A warranty provided by the manufacturer (see “Inverter warranty,” “Mounting system warranty,” and “Panel warranty”).

Project Manager – Solar team member who will handle your project from start to finish.

ROI – Return on investment.

Renewable energy – Energy that is collected from resources which are naturally replenished, like sunlight, wind, and tides.

Rooftop Solar installation – Solar panels are mounted to the available Solar-optimal roof space of your facility.

Site meter – A device that meters export to the grid or reduction in purchased electricity depending on the site load.

Solar/Solar panels – Technology that enables you to generate your own electricity onsite by converting sunshine into electricity.

Storage – The process of storing Solar energy for future use, typically with an electro-chemical battery such as lithium ion.

Sustainability – The principle of supporting present and future generations by maintaining conditions where humans and nature can exist in productive harmony.

System design – The process of custom- designing a Solar system based on your facility and needs.

Tier 1 components – Equipment developed by manufacturers that are recognised by Bloomberg New Energy Finance as financially strong, experienced, worldwide brands.

Workmanship warranty – Centrica Business Solutions offers a two-year “Turnkey defects warranty” which ensures all equipment is installed to manufacturers’ specifications and all relevant codes and standards.