ST GEORGES CAY POWER COMPANY (SGCPC)

GLOSSARY & DEFINITIONS

Customers wishing clarification can inquire to SGCPC or URCA through their website. URCA edited and provided final approval for this document.

Automatic Transfer Switch (ATS): A device that automatically switches a building's electricity supply between two power sources (e.g., between the utility grid and a backup generator or battery system) so that power continues to be received safely without any manual action (like physically closing a switch or breaker). Refer also to "Manual Transfer Switch".

Bi-Directional Converter (BDC): An electronic device that allows electricity to flow from battery systems to electrical equipment and vice versa by converting:

- DC (Direct Current) power to AC power; or
- AC (Alternating Current) power to DC power.

This device is usually part of an Energy Storage System (ESS).

Capacity Factor: A measure of how much electricity a system actually produces compared to how much it could produce if it ran at full power all the time. It is calculated as:

$$Capacity\ Factor = \frac{Actual\ Energy\ produced\ in\ a\ Year}{Rated\ Power\ x\ 8760}$$

Where 8760 is the number of hours in a year (365x24).

DC-AC Derate Factor: A design ratio comparing the total solar panel capacity (DC) to inverter output capacity (AC). Solar panels are usually installed with more DC capacity than the inverter can output, because panels rarely operate at peak power. Typical values range from 1.2 to 1.4.

Energy: The amount of electricity used or produced over time, measured in kilowatt-hours (kWh). A simple comparison:

- Power = speed of a car
- Energy = distance traveled

Energy Storage System (ESS): A system, usually made of batteries and control electronics, that stores electricity for later use. It includes equipment to convert electricity between AC and DC forms and must meet recognized safety standards.

Feed-In Tariff (FiT): The payment rate the utility pays a customer **for excess solar electricity exported back to the grid**. This rate is published in the utility tariff schedule.

Flicker: A noticeable blinking or fluctuation in lights caused by sudden or repeated voltage changes, often due to motors or large equipment starting and stopping.

Genset: A machine that produces electricity using an engine and alternator in residential or commercial applications and is used as backup power during outages. Under section 22(3) of the Electricity Act 2024, a licence is not required for standby generating plants approved by the Ministry of Works, with a generating capacity not exceeding 1,000 kW, provided they are used solely to supply electricity during a failure of supply by a public electricity provider or in other emergency situations. Operation of backup generators for routine or non-emergency purposes is strictly prohibited.

Grid: The network of electrical wires, poles, and equipment used by the electric utility to deliver electricity throughout its service area.

Grid Interconnection Application (GIA): The document developed by a utility that is intended to lead to an Interconnection Agreement between privately-owned generation systems (such as a solar system) and the electrical utility. (The application once approved will allow the privately-owned system to connect to the electrical grid through an interconnection agreement.)

Grid-Tied PV System: A solar power system connected to the utility grid. It includes solar panels, inverters, mounting systems, wiring, and monitoring equipment. It may operate with battery storage or without battery storage.

Grid-Tied PV System with ESS: A solar system connected to the grid that also includes battery storage. It can continue supplying electricity even if the grid fails, provided safety equipment disconnects it from the grid during outages.

Grid-Tied PV System without ESS: A solar system connected to the grid but without batteries. It cannot operate when the grid is down, unless a generator is available.

Grounding: The intentional connection of electrical equipment or wiring to the earth (ground) to improve safety and system stability. Grounding helps prevent electric shock, reduces the risk of fire or equipment damage, and provides a stable reference point for system voltage during normal operation and electrical faults.

Harmonics: Electrical disturbances that distort normal voltage or current waveforms. Harmonics can cause equipment overheating, noise, or malfunction.

Hybrid Energy System: A system in which two or more energy sources are used to produce electricity. The sources can include renewable or non-renewable energy sources. A hybrid setup is created so that a user is not entirely dependent on one source of power.

Inverter: A device that converts DC electricity from solar panels or batteries into AC electricity used in homes and businesses.

Inverter Anti-Islanding: A safety function that automatically stops solar systems from sending electricity to the grid during outages, protecting utility workers and equipment.

Inverter Islanding: A condition where a system continues generating its own voltage when the grid is down. This is unsafe when connected to the utility system and is not allowed without proper isolation. Industry safety standards (IEEE-1547 and UL-1741SB) require that PV Inverters stop exporting power when they sense a grid failure (lack of grid voltage waveform).

Kilowatt (kW): A unit measuring instantaneous electrical power.

Kilowatt-hour (kWh): A unit measuring electricity used over time, commonly shown on electricity bills.

Levelized Cost of Energy (LCOE): The average lifetime cost of producing electricity, expressed as cost per kWh, including installation, maintenance, and operating costs.

Manual Transfer Switch (MTS): A switch that allows a person to manually select between two power sources, such as grid power and a generator. Refer also to “Automatic Transfer Switch”.

Off-Grid System: A power system that operates independently of the utility grid, using solar panels, batteries, and possibly a generator.

Photovoltaic (PV) means the physical process of converting sunlight to electricity.

Photovoltaic (PV) Inverter: A device converting solar panel DC electricity into usable AC electricity. It cannot operate alone and must be connected to a voltage source such as the grid or battery system.

Photovoltaic (PV) Module: Also known as a solar panel, this device converts sunlight into direct current (DC) electricity. When two or more solar panels are electrically connected and installed together, they are referred to as a solar array, which functions as a single power-producing unit.

Photovoltaic (PV) System: A complete solar power installation, possibly including batteries or generators, that may operate either connected to the grid or independently.

Power: The rate at which electricity is being used or produced, measured in kW or MW. Power is like the speedometer of

electricity.

Point of Common Coupling (POCC): The physical point where a customer's generation system connects to the utility's electrical network. Also referred to as the Point of Interconnection (POI).

Rectifier: A device converting AC electricity into DC electricity. Refer also to "Inverter" and "Bi-Directional Converter".

Total Harmonic Distortion (THD): A measure of how many electrical waveforms are distorted by harmonics Refer also to "Harmonics".

Voltage protection (over/under): Protective equipment that disconnects circuits if voltage becomes too high or too low to prevent equipment damage.

Voltage (current) Waveform: The shape that shows how voltage or current changes over time. AC electricity normally follows a smooth sine-wave pattern.

Yield: The amount of energy produced annually compared to system size. In The Bahamas, solar systems ideally produce **1,500–1,650 kWh per year per kW installed**.