



EXECUTIVE SUMMARY

A backup system starts with the load

A warehouse can have solar panels on the roof and still lose its internet, cameras, access control or dispatch workstation when the grid fails. The result depends on how the inverter, batteries, circuits and changeover have been designed—not the number of panels visible from outside.

Begin with the work that must continue. Some sites only need the network, phones, security and a few lights. Others need picking stations, roller doors, refrigeration or production equipment. Each choice changes the required inverter output, battery capacity, wiring and cost.

The buying decision: Agree the essential loads, the number of hours they must run and the conditions under which that promise will be tested before comparing equipment quotations.

Panels generate power in suitable daylight. The inverter supplies the protected circuits within its rated limits. Batteries supply stored energy when generation is insufficient or unavailable. A grid-connected solar installation without suitable backup design may shut down during a grid outage.

A useful proposal shows measured demand, starting loads, usable battery energy, protected circuits, operating limits and a witnessed acceptance test. Daytime savings and outage backup are different design aims.

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The report moves from the loads that must remain powered to the checks needed before accepting an installed system.

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Bring these facts to the quotation meeting

A recent electricity bill, a list of essential circuits and equipment, typical operating hours, any equipment with a motor or compressor, and the duration that critical work must continue. The installer can then measure and verify the electrical demand rather than size from a guess.

Who uses the record

The warehouse manager identifies essential functions. The electrical designer measures the demand and checks the existing installation. The buyer compares proposals against the same load schedule. Together they witness the acceptance test and record any limits before sign-off.

MAIN ARTICLE

What must your warehouse keep doing?

A practical way to specify solar, inverter and battery backup

At 14:10, a local power fault stops the warehouse. The CCTV recorder and fibre router are in one cabinet, the dispatch computers in another, and the roller door on a separate circuit. A quote promising “four hours of backup” is meaningless until somebody says which of these loads are included and what operating conditions apply.

1 Define the work before sizing the system

Write down the functions that must continue during an interruption. For each function, trace the equipment it needs. A dispatch computer is little use if its switch, Wi-Fi access point, label printer and internet router are dark. Cameras may still record locally while remote viewing fails because the router has no power.

Separate the list into essential, useful and deferrable loads. Start with a small, clearly labelled essential-load board. Do not quietly add heaters, kettles, air conditioners or extra machinery after the system has been sized.

2 Understand what each part does

Part	What it contributes	What it does not guarantee
Solar panels	Generate electricity in suitable daylight.	Night-time supply or operation during an outage by themselves.
Inverter	Manages power flow and supplies compatible circuits within its rated limits.	That every warehouse circuit is backed up or that any motor will start.
Battery	Stores energy for the connected loads when needed.	A fixed number of hours regardless of actual load and usable capacity.

The installation design matters as much as the component list. Ask which circuits are on the backup output, whether changeover is suitable for sensitive equipment, how the system behaves when the battery reaches its reserve level and what happens when grid power returns.

3 Measure demand and allow for starting loads

A nameplate wattage or a month’s electricity bill is a starting clue, not a complete warehouse load profile. Record the simultaneous power draw of the proposed essential circuits and how it changes across the working day. Motors, compressors, pumps and roller doors may draw more power briefly when starting than while running. The installer must check both continuous inverter output and short-duration surge capability against the equipment that can start together.

Consider how staff will use the building in an outage. A battery estimate based on only lights and computers will fail if a forklift charger or workshop tool can also be switched onto the protected circuit. Metering and an agreed operating rule prevent that surprise.

4 Specify duration with usable energy

Backup duration depends on usable stored energy and the real load. As a simplified illustration, an average essential load of 3 kW running for four hours needs roughly 12 kWh delivered to those loads. The specified battery capacity must allow for the permitted depth of discharge, conversion losses, reserve and battery ageing. This is an illustration, not a system design or a battery quotation.

Ask whether the duration assumes the battery starts full, whether panels will be producing during the outage, and how quickly the battery can recharge while the business still uses electricity. Test an evening scenario as well as a sunny daytime scenario. A claim of “four hours” without these conditions cannot be verified.

5 Decide whether the aim is savings, backup or both

Panels can reduce electricity bought during suitable daylight hours when on-site demand and system design allow it. Batteries shift or reserve energy and support selected loads through interruptions, but add cost and operating limits. The best mix depends on measured consumption, tariffs, export permissions, roof conditions and the business value of staying open. Do not estimate savings by multiplying panel capacity by the number of daylight hours and treating the result as guaranteed production.

South Africa's national generation picture improved substantially in 2026, but a site may still face local network faults or planned interruptions. Evaluate the investment against the site's own bill and outage experience, rather than a generic load-shedding assumption.

6 Check the roof and the electrical path

Before accepting a design, confirm usable roof area, orientation, shading, structural suitability, safe maintenance access and the route from panels to inverter and distribution boards. A large warehouse roof is not automatically a suitable solar roof. The installer must also account for existing electrical capacity, protection, earthing, isolation and the location and environmental conditions of batteries and inverter equipment.

Ask the installer to set out the applicable supplier or municipal approval process, metering and export arrangements for the actual site. Requirements can differ by supply area and configuration. Obtain the required electrical certification and as-built drawings, and retain the equipment manuals and warranty terms.

7 Compare quotations on the same basis

A low price may cover a different load list, a smaller usable battery, fewer protected circuits or less installation work. Give each bidder the same written load schedule and duration requirement. Request the proposed panel capacity, inverter continuous and surge ratings, battery usable capacity, protected circuit schedule, assumptions, monitoring, maintenance and exclusions.

Ask who responds when the system is available but the warehouse still loses a protected service. A solar contractor, network provider and security installer can each have a working component while the end-to-end function fails. The proposal should name the handover point and support responsibility.

PRACTICAL TOOL

Warehouse power decision record

Complete this before approving a proposal or accepting an installation

Record	Your site / agreed requirement
Essential functions	_____
Equipment and circuits included	_____
Measured running load and peak	_____
Starting loads and simultaneous use	_____
Minimum duration and starting battery state	_____
Daylight and night-time scenarios	_____
Battery usable capacity and reserve	_____
Inverter output and surge rating	_____
Roof, electrical and approval checks	_____
Monitoring, maintenance and support owner	_____

Acceptance test to witness

- Run the agreed essential circuits under a realistic working load. Confirm that routers, switches, phones, cameras, access control and required warehouse equipment remain available.
- Simulate a grid interruption with the installer present. Record any interruption, failed device, alarm, changeover behaviour and equipment that cannot start.
- Test the agreed battery reserve and duration under documented conditions. Where a full-duration test is impractical, agree a measured test and the calculation used to support the duration claim.
- Confirm what happens on low battery and grid return. Check monitoring access, fault notifications, circuit labels, drawings, certification, warranties and staff instructions.

Acceptance rule: Sign off against named loads and recorded results—not a demonstration that the inverter display lights up.

CLOSING PERSPECTIVE

Buy the outcome you need

A warehouse does not need every socket backed up to gain value from solar and storage. It needs the right circuits protected for the right duration, with clear limits staff can understand. In some buildings, keeping the network, security and dispatch running is enough. In others, the critical requirement is a roller door, cold room or production process, and the engineering changes accordingly.

The useful conversation begins with a load schedule and an honest account of the site's electricity use and interruptions. It ends with an installation that has been tested against that schedule. The panels, inverter and battery are the means; continued operation is the result to verify.

Educational note: This report is general information, not a site-specific electrical design or a guarantee of savings or backup duration. Have a qualified installer assess the premises and confirm applicable electrical and connection requirements.