Off-Grid Load Audit Worksheet

Record appliance power, quantity, daily runtime and starting surge before choosing panel, inverter or battery capacity.

Customer and site details

Customer / organization _____	Survey date _____
Installation address _____	Survey engineer _____
Mobile / email _____	Grid availability and outage pattern _____

Appliance load schedule

Appliance / circuit	Qty	Rated W	Surge W	Hours/day	Essential?	Daily Wh
					[ ] Yes	
					[ ] Yes	
					[ ] Yes	
					[ ] Yes	
					[ ] Yes	
					[ ] Yes	
					[ ] Yes	
					[ ] Yes	
					[ ] Yes	
					[ ] Yes	
TOTAL						

Sizing Inputs and Design Decisions

Use the audited load to define autonomy, battery operating limits, inverter surge capacity and the solar recharge target.

Required design inputs

Essential connected load (W) _____	Highest simultaneous load (W) _____
Largest motor starting surge (W) _____	Daily essential energy (Wh/day) _____
Required backup duration (hours) _____	Days of autonomy _____
Preferred battery chemistry _____	Nominal DC system voltage _____
Usable depth of discharge (%) _____	Inverter efficiency (%) _____
Peak sun hours used for design _____	Future load margin (%) _____

Before final sizing		
[ ]	Confirm rated wattage from appliance nameplates or manufacturer data.	Notes: _____
[ ]	Separate essential circuits from comfort and non-critical loads.	Notes: _____
[ ]	Record starting surge for pumps, compressors, refrigerators and air conditioners.	Notes: _____
[ ]	Confirm battery temperature, ventilation, access and manufacturer clearances.	Notes: _____
[ ]	Check inverter continuous rating, surge rating, waveform and DC voltage compatibility.	Notes: _____
[ ]	Apply cable, overcurrent protection, isolation, earthing and surge protection requirements.	Notes: _____
[ ]	Confirm the proposed PV array can recharge the selected battery within the design window.	Notes: _____

Calculator Workflow and Sign-Off

Use the calculators in this order, then have the selected equipment and protection scope verified before purchase.

Calculation sequence		
[ ]	Complete the appliance schedule and identify essential loads.	Notes: _____
[ ]	Use the Appliance Load Calculator to estimate connected load and daily energy.	Notes: _____
[ ]	Use the Battery Backup Calculator to select backup hours, battery chemistry and system voltage.	Notes: _____
[ ]	Check inverter continuous power and starting surge against the largest simultaneous load.	Notes: _____
[ ]	Confirm PV array size, recharge time and controller limits against product datasheets.	Notes: _____

Recommended next step

Enter the completed appliance schedule into the Appliance Load Calculator, then use the Battery Backup Calculator with the selected backup hours and battery chemistry. Final ratings must be confirmed against site conditions and product datasheets.

Design review

Prepared by _____	Reviewed by _____
Proposed inverter rating _____	Proposed usable battery capacity _____
Proposed PV array capacity _____	Review date _____

References

US DOE: Off-Grid or Stand-Alone Renewable Energy Systems - energy.gov/node/1265956
US DOE: Balance-of-System Equipment Required - energy.gov/energysaver/balance-system-equipment-required-renewable-energy-systems
IEC 62124:2004 - Photovoltaic stand-alone systems, design verification - webstore.iec.ch/en/publication/6483