

Backup Options

- Solar system alone does not provide backup power
- Solar must disconnect from grid when grid is down
- A battery is needed for solar to support emergency backup



- Start by calculating emergency loads and how long backup energy required (hours, days or weeks)




Backup Options



| Type | Use Case |
|---|---|
| Gas generator | Emergency power – short term <ul style="list-style-type: none">- Up to 5000 Watts, 120 and 240 V- Multiple outlets with extension cord- Must be operating continuously and refueled every 8 to 24 hours |
| Portable battery “solar generator” | Emergency power and camping – short term <ul style="list-style-type: none">- Up to 3000 Watts, 3000 Watt-hours per unit- Portable, multiple outlets including USB per unit- Can be used indoors near end use |
| Generator or portable battery + manual transfer switch | Emergency power – short term <p>Integrated with limited <u>critical home circuits</u> with manual switch</p> |
| Solar + batteries AC-coupled | Emergency power plus load shifting – long term <ul style="list-style-type: none">- Up to 7000 Watts, 14,000 Watt-hours per unit (Tesla Powerwall)- <u>Seamless</u> backup to critical circuits; requires critical load center- Already having solar and adding batteries- Planning to add batteries later |
| Solar + batteries DC-coupled | Emergency power plus load shifting – long term <ul style="list-style-type: none">- Up to 7000 Watts, 14,000 Watt-hours per unit- <u>Seamless</u> backup to critical circuits, requires critical load center- Installing new solar + battery system at same time |

Backup Options



| | Cost | Installation | Operation & Maintenance |
|--|--|---|--|
| Gas generator  | \$500 to \$3000 per unit plus fuel | Easy, no permit | <ul style="list-style-type: none"> - Manual start, noisy - External cord - Annual testing - Fresh fuel |
| Portable battery  | \$1000 to \$3000 per unit plus <u>portable</u> solar panels (\$200 to 400 each) if desired | Easy, no permit - Can be used indoors and camping | <ul style="list-style-type: none"> - 10 - 20 hours of power for frig, silent - Can charge from EV, gas car or <u>portable</u> PV |
| Generator or portable battery + manual transfer switch  | Cost above plus \$500 to \$2,000 | Electrician needed | - Limited power to select circuits in home |
| Solar + batteries AC-coupled | \$18,000 - \$30,000 <u>plus solar cost</u> (26% federal tax credit) (CA SGIP rebate if cycled, \$3800 for 13.5 kW) | <ul style="list-style-type: none"> - Complex - Batteries can be <u>added after solar</u> - Battery & solar inverters best if compatible - Critical load center required | <ul style="list-style-type: none"> - Seamless - Less efficient (~5%) than DC coupled - More options for sizing, expansion & placement |
| Solar + batteries DC-coupled | \$18,000 - \$30,000 <u>plus solar cost</u> (26% federal tax credit) (CA SGIP rebate if cycled) | <ul style="list-style-type: none"> - Complex - Best to install batteries and solar together - Single inverter | <ul style="list-style-type: none"> - Seamless - Limits power options & expansion since single inverter for PV and battery |