Options for EnviroKarma Solar Battery Backup Systems, rev. 10/31/2020

The basic Battery Backup System (BBS) from EnviroKarma is designed to provide reliable power at the lowest cost with reasonable quality/value components. The heart of the system is a pure-sine Inverter rated to output up to 3000 watts at 110vAC continuously. This is more than a single average 'home outlet', and should be enough power to run several individual appliances, or used as a 'generator' to energize multiple 110vAC outlets in a home as long as the total load does not exceed 3000 watts at any given time once the home has been isolated (disconnected) from normal Grid power and any Grid-tied PV system.

The Inverter has two built in 110vAC 15amp outlets, and one 20amp terminal block for heavy duty or hard-wired applications if used to 'backfeed' to a service panel and energize multiple outlets.

There are multiple ways to configure and install a BBS to meet your needs. Variables are:

- Type of installation: stationary shelving or portable (with a dolly)
- Number of Solar panels, determining how much Energy is available daily
- Type of batteries: Flooded Lead Acid (FLA), Absorbed Glass-Matt (AGM), or Lithium
    - FLA, commonly called 'deep cycle' or RV batteries are the least expensive, but require periodic maintenance watering, and will spill acid if tipped over.
    - AGM, are non-spillable sealed lead and last about 700-1000 charge/use cycles if discharged to no more than 50% of total capacity.
    - Lithium batteries are about 2x as expensive as AGM, but smaller, lighter, and will last 2000-5000+ charge/use cycles if discharged to no more than 80% of capacity
- Number of batteries, determining how much energy is available when Solar is not available. Typical 'small system' batteries are available in about the same max capacity of 100ah x 12v = 1kWhr of energy for ease of use and handling in about the same space. Lithium batteries are significantly lighter, and a little smaller, and require half as many for same usable energy. A decent rule of thumb on capacity required is 2kWhr per refrigerator for 8hr service.

Typical configuration might be :

- 100w solar to recharge .5kWhr/day
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- 3000w inverter
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- 1 to 4 AGM batteries (1 kWhr max /.5 usable ea.)
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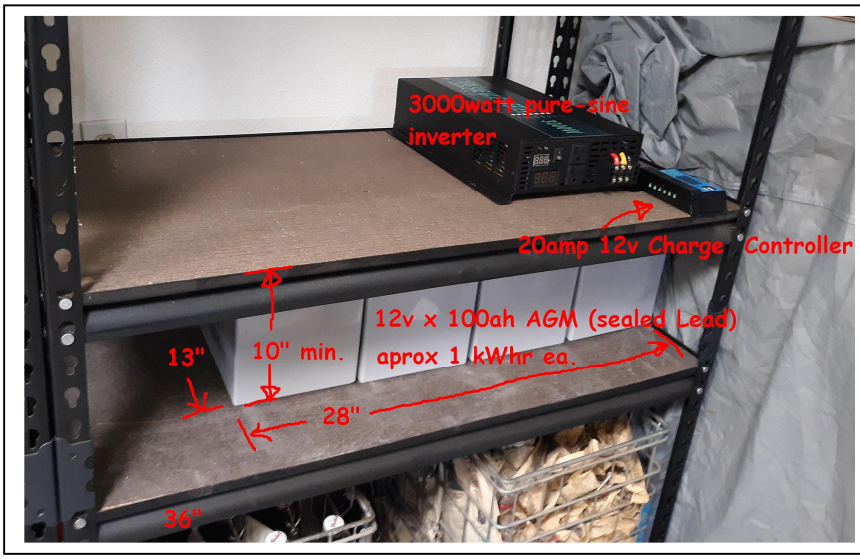
- Garage shelf mount



Configuration / Cost worksheet

component	cost	option	
3000 watt pure-sine inverter	$375		enough power for household basics
1000 watt pure-sine inverter		$200	smaller, for camping or light use
20a charge controller	$20		
100w Solar panel + foldable ballast rack	$220		provides about 500 watt-hr on sunny day
additional 100w panel/rack ea.		$220	to provide more daily energy
stationary install - 2 shelf garage unit	$50		
portable package - dolly backer board		$50	stacked and strapped vertically
portable package - dolly		$50	if you need a dolly
portable package - carryon luggage		variable	for smallest, lightest package
FLA - 100+ah (stationary only)		$175	lowest cost, require watering
AGM - 100+ah sealed	$250		aprox 700 cycles at 50% DOD
Lithium - 100+ah 'MightlyMax' 2yr warr		$700	2000+ cycles at 80% DOD, internal BMS
Lithium - 100+ah 'Renogy' 5yr warr		$925	4000+ cycles at 80% DOD, internal BMS
Lithium - 25ah, or 50ah available		variable	for smallest, lightest package
M-M 'generator' adaptor		$30	for back-feeding home outlet(s)
delivery + install	$250		plus $1/mile outside SF City limits
wire	$25		plus $0.50/ft over 50 ft
example minimum, 1 panel, 1 AGM batt	$1,190		
or	$1,940	adding 3 addl AGM batteries for more capacity	
or	$2,600	adding both 3xbatteries and 3x panels