

# Power / Solar Power

## The promise of Solar Power

When we hear the word "solar," thoughts of "green energy" and even "free energy" often spring to mind. Yet, it's important to recognize that solar power systems can be costly, and the return on investment isn't immediate—especially compared to the low costs of grid-supplied electricity.

At Burning Man, however, the situation is quite different. Here, there is no grid. The predominant sources of power are gasoline-powered generators. Some camps deploy massive, industrial generators that are not only expensive to transport but also consume large quantities of gasoline. Unfortunately, these generators contribute to environmental pollution through noise, odors, and harmful emissions.

In the unique setting of Burning Man, adopting solar energy offers a distinct advantage. Solar power provides a quiet, clean energy source that doesn't emit noise or pollutants. This means it can be set up anywhere, allowing participants to enjoy their music and conversations without interruption. Moreover, solar energy enhances self-reliance—a crucial benefit, particularly in hypothetical apocalyptic scenarios where gasoline might become scarce. Unlike gasoline, sunlight is an ever-abundant, freely available resource.

## BMORG Pressure

The BORG is applying gentle pressure on camps to give up their gas based generators in favor of solar power. It is not a hard requirement, and in my opinion we should always have generators as backup (because things can break), but seeing as we already have a solar power system, we might as well continue using it and even slowly expanding it to more reliably cover 24 hours of power for the camp.

## How it performed in 2023

Let's just start by saying it's a good thing we had backup generators, for several reasons:

1. We miscalculated our power draw, and due to the radio station we operated, as well as a massive antenna covered in LED lights, we drew more power than originally anticipated.
2. The weather got weird and we had clouds & rain, which resulted in the now famous mudpocalypse.

However during the sunny days of the event it performed fantastically well, and we enjoyed noise-free days (as well as the knowledge and satisfaction of knowing we were getting ample power from the sun!).

During the day, our battery bank was being charged while the panels powered several air conditioning units, a small ice making machine, a charging station for phones & batteries, lights, fans, and god knows what else (and I say this because on various occasions, some people just plugged in their tent A/C's etc.).

### Some key facts from 2023:

- The peak output from the panels was 5kW/hr. Theoretical max is about 5.3kW/hr and about 6.5kW/hr with bifacial gain.
- The average daily energy produced was about 27kW/hr. The best days (no dust storms or clouds) were 33-34kW/hr.
- The batteries would last until about 4-5am on days with less than max production.
- Some days we filled the batteries by 11am, and had lots of potential energy not collected.



Seen above is a team of 5 people who spent almost an entire day cumulatively, to build the frame that holds the solar panels, so they can be properly mounted (and not blown away by the winds, which can get pretty strong in BRC).

The finished product:





## Existing hardware

The camp currently owns the following hardware:

Item name	Description	Quantity
<b>445W Solar Panels</b> <a href="#">Data Sheet</a>	Canadian Solar High Efficiency 445W Mono Bifacial Solar Panels	12
<b>Solar Panels Mounting Kit</b>	Solar Mount & Racking (Array Tilt = 30deg) Constructed using 1/2" Galvanized Pipe & Fittings	TBD (need to count @ storage)
<b>Solar Inverter</b> <a href="#">User Manual</a>	6kw 48v 120/240vac inverter MPP Solar LVX6048 (mounted to power board with dc and ac distribution panels, Solar disconnect, fuse blocks, battery bus bars, etc)	1

<b>Genmax Generator</b> <a href="#">User Manual</a>	Genmax 6000iED Inverter Generator. This Genmax can supply split phase power directly to the solar Inverter if the batteries run low, and charge up the batteries as well.	1
<b>Honda Generator</b> <a href="#">User Manual</a>	Honda 3000is Generator Power for furnace, fridge, most 13,500 BTU RV AC units, & more. Super quiet & fuel efficient, Electric start, Inverter (stable power for computers), CO-MINDER: advanced carbon monoxide detection system.	2
<b>EVE LF-280K Batteries</b> <a href="#">Vendor Link</a>	EVE 280Ah Prismatic LiFePO4 Cell: This battery is widely used in electric vehicles, electric motorcycles, solar power, energy storage, etc.	12

## New hardware requirements for 2024

### Mounting kit

Jack is proposing we purchase mounting equipment from this company <https://integrarack.com/>

Their mounting mechanism makes it quick and easy to install solar panels. Their products can be purchased here:

<https://solarpowerdistributors.com/product/ir30-ballasted-ground-mount-racking-system/>

Jack estimates around \$1500 for the full kit.

### Extra Batteries

While we do not plan to run a radio station in 2024, I still think we need to expand our battery bank if we want to run 24/7 with not ever needing to start an ICE based generator. I do think we should bring them with us, as an emergency, but ideally we should be able to avoid using them throughout the entire length of the event.

### Conclusion: What we need to purchase

To bring the system up to spec, we'll need to purchase the following items/products:

Item name	Description	Quantity

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