Go RV Solar

RV SOLAR: HOW IT WORKS & HOW IT CAN WORK FOR YOU

RV SOLAR EXPLAINED LIKE A BUDGET (BECAUSE THAT'S WHAT IT IS)

Opening

Before we talk about panels, batteries, or anything technical, I want to make one thing very clear:

RV solar is not an electrical problem.
It's a money problem.

Every RV solar system—good or bad—follows the same rules as a household budget.
Once you understand the budget, solar suddenly makes sense.

RV SOLAR EXPLAINED LIKE A BUDGET (BECAUSE THAT'S WHAT IT IS)

So today, I'm going to explain RV solar the way I explain it to people who are frustrated, confused, or convinced solar "doesn't work."

I explain it like money.

THE BIG PICTURE: YOUR RV IS A BUDGET

Here's how I want you to think about your RV:

- **Solar panels = your paycheck**
- **Batteries = your bank account**
- **12-volt system = small subscriptions**
- **Inverter power = big money spending**
- **Appliances = individual big purchases**

If those don't line up, you go broke electrically speaking.

SOLAR PANELS ARE YOUR PAYCHECK

Solar panels are your **paycheck.**

They don't give you unlimited power.
They limit what you can use based on how much you have.

SOLAR PANELS ARE YOUR PAYCHECK

Just like a **paycheck:**

- Bigger solar system = bigger paycheck
- Smaller system = tighter budget
- Clouds = reduced hours
- Winter = seasonal pay cut
- Shade = getting sent home early

SOLAR PANELS ARE YOUR PAYCHECK

Solar only earns money **during the day.**
At night, the paycheck stops.

That means solar panels alone don't power your RV.
They only decide **how much power you're allowed to earn.**

BATTERIES ARE YOUR BANK ACCOUNT

Your batteries are your **bank account**.

This is where your paycheck gets stored so you can spend it later.

Two very important things about bank accounts:

1. They have **limits**
2. You can only spend what's in them

BATTERIES ARE YOUR BANK ACCOUNT

A small battery bank is like having a low balance with no savings.
A big battery bank gives you flexibility but it's still not infinite.

This is where most RV solar systems fall apart:

- People earn money (solar panels)
- But the bank account is too small
- So power disappears quickly

When the batteries are empty, solar has to work just to refill the account before you can spend anything again.

DIFFERENT TYPES OF BATTERIES

LEAD ACID & AGM

- Limit spending to half of what they can store - 100Ah = 50Ah use
- Less expensive upfront, but replacement cost makes them more expensive over time
- Weighs more per Ah

LITHIUM

- Can spend what it can store - 300Ah = 300Ah use
- More expensive upfront, last a lot longer
- Smart technology - Different Batteries Have Different Features Ask About Features Before Purchasing - Bluetooth, Heated, Low Temp Cutoff, Waterproof, Fire Suppression, Power Button, Surge Protection, and Short Protection

Check out Will Prowse on YouTube. He tests batteries and takes them apart and gives an honest opinion of batteries.

If the battery you are looking at hasn't been tested by him ask the battery manufacturer why not?

THE 12-VOLT SYSTEM IS SMALL SUBSCRIPTIONS

Your 12-volt system is like **small monthly subscriptions:**

- Netflix
- Hulu
- Spotify

These are:

- Low cost
- Easy to afford
- Barely noticeable day-to-day

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THE 12-VOLT SYSTEM IS SMALL SUBSCRIPTIONS

In your RV, 12V powers things like:

- Lights
- Fans
- Water pump
- Furnace blower
- USB charging
- Control boards

THE 12-VOLT SYSTEM IS SMALL SUBSCRIPTIONS

Because these don't use much power, they sip gently from the bank account.

That's why people can boondock for days running lights and fans and think, "Wow, solar works great!"

It does because subscriptions don't break the budget.

THE INVERTER IS BIG MONEY SPENDING

The inverter is where things change.

Inverter power is **big money spending:**

- RV payment
- Fuel
- Amazon orders

Anything that hurts when you check your bank balance

THE INVERTER IS BIG MONEY SPENDING

The inverter doesn't create power it just lets you **spend** power.

And just like real life:

- Being approved for a big purchase doesn't mean you can afford it
- The bank account still decides how long what's in your account lasts

DIFFERENCES IN INVERTERS

- Modified Sine Wave - Is not good for most appliances. Can damage some and other appliances won't work at all.
- Pure Sine Wave - Provides good clean AC power just like you should get from the electric company or a generator.
- Inverter Only - Only converts 12v to 120v power
- Inverter Charger - Converts 12V to 120V and supplies charge to batteries when shore power or generator power is present. It's like getting a Bonus on your paycheck.
- Hybrid Inverter Charger - Converts 12V to 120V, Charges batteries when shore power or generator power is present, Can convert 12V to 120V when plugged into shore power or generator power.

APPLIANCES ARE INDIVIDUAL BIG PURCHASES

This is where it really clicks.

- **Air conditioner = RV payment**
  Big, constant, expensive, and unforgiving
- **Microwave = car payment**
  Short use, but hits hard
- **Electric water heater = utility bill**
  Quiet, steady drain you forget about
- **Coffee maker = daily habit**
  Doesn't seem bad—adds up fast

APPLIANCES ARE INDIVIDUAL BIG PURCHASES

One big purchase can wipe out the account.

Several medium ones will quietly drain it.

Your RV doesn't "lose power."

You **ran out of money.**

WHY SOLAR SOMETIMES FEELS LIKE IT DOESN'T WORK

When people say solar doesn't work, what they usually mean is:

- The paycheck is too small
- The bank account is limited
- Subscriptions are fine
- Big purchases are killing them

Solar systems don't fail randomly.
They fail because the **spending habits don't match the income.**

THE BIG QUESTION: CAN SOLAR RUN AIR CONDITIONING?

Yes, but let's stay honest.

Running air conditioning is like committing to a large monthly payment.

To afford it, you need:

- A strong paycheck (lots of solar)
- A healthy bank account (lots of batteries)
- Fewer unnecessary big purchases

THE BIG QUESTION: CAN SOLAR RUN AIR CONDITIONING?

Some people want:

- An hour or two → very doable
- Overnight → takes planning
- All day → requires serious income and savings

Solar doesn't change math.

It just changes where the money comes from.

IS RV SOLAR RIGHT FOR YOU?

SOLAR WORKS GREAT IF:

- You like quiet power
- You boondock or dry camp
- You're okay managing a budget
- You want independence
- You have pets you leave in the RV while away

SOLAR MAY NOT BE THE RIGHT TOOL IF:

- You want unlimited power with no thought
- You expect it to replace shore power completely
- You don't want to adjust spending habits

Neither choice is wrong.

THINGS TO CONSIDER WHEN DESIGNING YOUR SYSTEM

Weight

- Many people will install large racks on the roof and add thousands of watts of solar. What happens when you add upwards of 500-1000 lbs to your roof?
- If your RV had 1 battery, but you are added 3 Lithium Batteries
- Where is all the weight being distributed
- You are going to lose storage space and capacity(weight)

THINGS TO CONSIDER WHEN DESIGNING YOUR SYSTEM

Airflow

- Victron requires 10 cm of space around many of their parts
- Heat needs a place to go to keep your system functioning properly

THINGS TO CONSIDER WHEN DESIGNING YOUR SYSTEM

Wires and connections

- Proper wire sizing and length for the power being consumed
- Proper connections where the wires connect to components. Ferules, Lugs, etc..
- Wiring is secured in a safe manner

THINGS TO CONSIDER WHEN DESIGNING YOUR SYSTEM

Quality of Components

There are lots of batteries on the market. Check out Will Prowse on YouTube to compare batteries before purchasing.

THINGS TO CONSIDER WHEN DESIGNING YOUR SYSTEM

Battery Considerations

- Bluetooth
- Heated or Low Temp Cutoff?
- Waterproof, Water Resistant, or Neither
- Fire Suppression
- Victron Comms or No Comms (Need Shunt)
- Self Balancing or No Balancing
- Cheap Batteries may produce Cheap Results (cheap batteries may not be able to start your generator)

THINGS TO CONSIDER WHEN DESIGNING YOUR SYSTEM

Inverter Considerations

- Is it a charger also?
- Is it hybrid?
- Will it run anything in the RV or just some things?
- Are the settings programmable?
- Is there a system to monitor and change settings inside the RV?
- Is the system an all-in-one system or are there different components that control everything?

THINGS TO CONSIDER WHEN DESIGNING YOUR SYSTEM

How quickly can my solar and other charging systems charge my batteries?

SOLAR

- Will I have enough solar to charge and use the batteries
- How will the panels be mounted to my roof?

CHASSIS CHARGING

- Does my current motorhome BIM support lithium battery charging?
- Is my alternator big enough to supply charging while driving?
- Do I want to keep my battery boost button operational?
- Do I need to modify my tow vehicle?

CLOSING

If you remember nothing else from this talk, remember this:

- Solar panels are your paycheck.
- Batteries are your bank account with limits.
- 12-volt power is small subscriptions.
- Inverter power is big money spending.
- Appliances are individual major purchases.

Once you understand the budget, RV solar stops being mysterious and starts making sense.