

# Are You Maximizing Your Power Sources?

**TECH DOCTOR™**

**Power play**

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Do you effectively use all of the power sources in the electrical system of your road vehicle or marine vessel in the most effective way? If you take some time to ponder this you may realize that, unless you have a complex, automatically controlled system, you don't.

Think of all the power sources you have. Shore power, generator, inverter, alternator, solar panels, wind turbines, nuclear (okay, maybe not yet). Let's look at the limitations and benefits of each of these.

### **Shore Power**

Obviously the benefit of shore power is that it is constant as long as you're not moving and the power grid is not interrupted. This isn't necessarily unlimited power (it's limited to the breaker size feeding the outlet), but it's not intermittent. This allows you to power all devices and charge renewable storage (batteries) as fast as possible (or slower if other demands in the system increase) and hold them at full charge in preparation to unplug. The limitation is that it's not portable, which is kind of the point of owning a mobile vehicle, isn't it?

### **Generator**

Main benefit is that it's an onboard source of AC current. Like taking your shore power with you, except it uses fossil fuels which are limited in supply until you can get back to an outlet. The best way to use a generator is to use it at full bore and shut it down when demand drops below 50% of the generator's capacity (more on this in the inverter section).

### **Inverter**

The inverter is a great fill-in for the generator and can even partner with it for efficient use of resources. An inverter really shines under two conditions. 1) Low power draw for a long period of time (entertainment system, or small electrical devices). 2) A large draw

for a short period of time (microwave, short-term motors). These are both scenarios where a generator would be inefficient. Running a 15 kw generator for 500 W of electronics doesn't make sense, and running a generator at 50% capacity for 2-5 minutes doesn't allow the engine to warm up which will wear out engine components. Use the inverter, under these conditions, to draw the batteries down. At this point run the gen for air conditioners (or other large, long term loads), and charge those batteries back up, then go back to invert.

### **Alternator**

While motoring down the road or seaway, your alternator is spinning away providing amperage for charging the engine batteries and running electronics. However, once the engine battery is charged, what you do with your alternator can help you with the rest of the system. If you have a 200 A alternator, and the electronics draw less than 50A, consider engaging your battery combiner to channel some of the available amperage to your house/aux batteries. It'll charge like your generator would, without another engine running.

### **Solar and Wind**

These are related since the sun doesn't always shine and the wind doesn't always blow. These would be supplemental chargers for the battery bank, but use them as we described with the alternator. Once the house battery is charged, can that excess current be used for another bank? Combine them to take advantage of the free resource (okay, it might not have been free when you priced the components, but since you already have it...use it).

The bottom line is to use what you have to the full benefit of your system and don't let a power source go idle when that resource can be directed to another portion of your system to be used later.

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