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### **Can I charge my electric car from solar panels?**

My clients often ask me this question. I have two categories of clients, grid-connected and off-grid, and the answer is entirely different for each category. Here is how these two situations differ:

**Grid Connected:** The situation if you live on-grid is pretty easy. We can figure out how much energy you need for your car and how many solar panels will cover that need. Install panels and done. There are some caveats. More on this below,

**Off-grid:** For off-grid clients charging an electric car is much more complicated. Spoiler alert: It is rarely practical. To explain why, we need an analogy. To demonstrate electric current sometimes a water analogy is used. That is apt here.

Imagine your electric car is a bathtub on wheels. When you arrive home with your car batteries depleted it is like arriving home with an empty bathtub. You need to fill it up. In this analogy water represents energy.

If you live on-grid the water to fill your tub comes from a giant tank on a hill nearby (this represents the capacity of the grid). You can fill your mobile bathtub and you still have water to support your lifestyle. You can have a big faucet and fill your bathtub quickly.

Living off-grid in this analogy means you have a small tank on your property (this represents your battery bank). Your tank is probably smaller than the bathtub, so if you try to fill your car your home water tank is now empty, your car is not full and you can't take a shower.

Continuing with the analogy, you need to pump water to refill your tank so you can finish filling your mobile bathtub, but you have a slow well pump (this represents the limitations of a typical home solar panel system). It may take several days to pump enough water to fill your car. Then you can shower. In the meantime you can't drive, or at least not very far, and when you get back home your car is empty again.

Most off-grid clients do not have reserve system capacity beyond what they need even before they bring home an electric car. Charging an electric car, unless it is driven sparingly, will require as much or more energy than running your home. Most off-grid clients can't drive sparingly because they don't typically live close to town. That is why charging an electric car off-grid is rarely practical.

If you really want to charge an electric car living off-grid, prepare to spend generously to upgrade your power system to double what it probably is right now. Depending on your driving patterns, you may not need more solar panels but you will need a larger battery bank and more/bigger inverters. If you want to drive in the winter, especially during overcast periods, you will need a big generator and be willing to run it for hours.

This description is generic and applies to most of our off-grid clients. If you want an answer specific to your situation, contact us.

Back to solar car charging for our grid-connected clients: If you are planning a grid-tied solar electric system not yet installed you can plan in the extra solar you need to cover the car. You will need the extra space to hold the panels and a larger inverter. Panels are installed in increments dictated by the inverter, so you may not be able to install exactly the number of extra panels you want but there is usually an acceptable compromise.

If you have an existing system, integrating an upgrade has its own challenges.

This information may seem a bit discouraging, particularly to our off-grid clients, but it is our job to provide realistic answers, not to sell solar panels to someone without helping them to understand all of the details. If you want more information, contact us.

Sincerely,

William Miller