

Solar Chargers

Thanks to advances in materials, circuitry, and batteries, portable solar chargers are faster and more versatile than ever. —Alexander George

**Quickest
charge**



Solar Joos Orange

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RATING

No need to handle this one gingerly. The Orange survived a biblical downpour, a one-story defenestration onto concrete, and use as a speed bump. (OK, we accidentally ran it over with a motorcycle.) It was also the fastest charger in our test, capable of bringing a dead iPhone back to 100 percent after less than an hour of direct sunlight. The monocrystalline silicon nitride panel slowed significantly under cloud cover, but eight hours of decent light completely filled the 20-Wh battery, which holds more than enough juice to get through the night.

WIRED Collapsible stilts for optimal angling. Simple design. Tough enough to survive a trip to Mars. Hole for hanging or securing. **TIERED** Weighs almost 2 pounds. Doesn't like variable light. **\$149**

THE BASICS

Do these charge fast enough to be practical?

Finally, yes. As recently as 2008, when our gadgets

were tied to various proprietary cables, the batteries in solar chargers had to be tuned to dispense power at the lowest common denominator to ensure the flow of electricity wouldn't overwhelm low-voltage connections. Now, thanks to USB ubiquity, getting power from a portable solar charger is just as fast as plugging into the wall.

How long to juice up my phone?

A portable panel coated with standard monocrystalline silicon needs about two hours of direct sunlight to fully charge a smartphone. Flexible coatings of copper, indium, gallium, and selenide (CIGS) are slightly less efficient in direct sun but work better under cloud cover and behind UV glass, both of which cripple crystalline panels. But in general, bet on two to three hours.

How much power can these hold?

The batteries in most portable chargers have capacities of around 8.1 watt-hours—enough to charge two smartphones. But some have batteries in the 20-Wh range. After a day in the sun, one of those can fully charge an iPad, smartphone, and point-and-shoot camera and still have juice left over.

BUYING ADVICE

Don't do this to save money. In the US, electricity from the grid costs about 10 cents per kilowatt-hour. A \$150 solar charger with a meaty 20-Wh battery would take nearly 75,000 charge cycles to pay for itself. But if you spend enough time outdoors and away from wall sockets, going solar is a great way to make sure you've got backup juice. If you live in Arizona, a cheap crystalline unit will be fine. Seattle residents will want the more expensive CIGS panels. Buy the biggest battery-panel combo your wallet and backpack will allow.