



The owner of a tiny home just outside of Asheville stands on his porch.

Off the grid

Appearance vs. reality

□ BY MARY PEMBLETON □

Off-grid. It's a term that's come to imply the absence of technology, a woody atmosphere; Chacos kicked up on a camp chair. Or perhaps it brings to mind the savvy survivalist, isolated and well-stocked with future food sources and ammunition; or a pursuit of the simplicity of homesteading; a nod to a time when life was about cultivating one's own livelihood.

Taken in its most literal definition, it means simply to live independently from the infrastructure that is our power grid. In reality the motivation for doing such varies widely, ranging from the doomsday "prepper" to those who simply aim to reduce their monthly expenses, or those who intend to build far away from the grid and financially it makes more sense to go off-grid.

A power source certainly isn't

vital to survival, but for those who desire access to modern conveniences, it is a necessary addition. Solar power provides an excellent option for collecting and storing electricity, though not without some lifestyle adjustments for those used to having unlimited power accessible at the flip of a switch.

Grid-tied

That's not to mean that solar isn't also a viable option for households who want to live a modern lifestyle and maintain current electricity consumption. Grid-tied systems reduce or eliminate electric bills, providing a smart 10-year return on investment, on average.

With residential grid-tied systems, panels are mounted on the rooftop or the ground, depending on exposure to sunlight or the struc-

ture of the roof. The panels collect sunlight and produce direct current, or DC, power. An inverter is needed to convert the energy into alternating current, or AC, power. AC current is the type of electricity that our grid uses to maximize transmission efficiency, and most household appliances utilize AC current.

In most grid-tied residential solar situations in the state of North Carolina, a net meter is installed by the power company (some companies do not offer this option; Duke does) after the system is installed. This device keeps a record of how much energy your personal power plant is producing on a daily basis versus how much you are consuming, and shows up on your bill. If you don't use what you produce, it feeds the grid, and your neighbors can utilize it. You receive credit for any electricity you produce and don't use, and can bank what

you don't use. Currently, Duke offers an apples-to-apples exchange rate for the electricity you produce.

Off-grid

Off-grid systems utilize batteries to store the energy produced by solar panels that isn't immediately consumed; there is no connection to our community power grid whatsoever. There is great variation in off-grid systems in terms of the type of battery used, the number of panels, and the amount of power produced and stored.

Battery systems can be a great option when the cost of connecting to the grid (such as with a new, remote property on which its owners desire to build) equals or exceeds the cost of an off-grid solar system. The major benefits of an off-grid system is the ability to access pow-

er when there is an outage in the grid, along with the freedom from electric bills.

Depending on the amount of energy needed to fulfill the needs and wants of the consumer, off-grid systems that can power a standard household are typically quite a bit more expensive than grid-tied systems. Batteries are currently expensive and multiple batteries take up a good amount of space, and need to be replaced more often than other system components. That being said, technology is advancing quickly and industry-savvy folks are eagerly awaiting the next generation of batteries to hit the market.

Even with a large system, some lifestyle change is in order in order to live within the confines of energy produced by off-grid solar. Many people with this type of system operate on a schedule dictated by the time of day when energy production is highest, though with some perspectives on, one may view this is simply adhering to a daily cadence akin to nature's own rhythm.

Those with smaller systems may be required to sacrifice some convenience; to opt for sources other than electricity for cooking, to unplug anything not in use, to use a little elbow grease for daily tasks rather than electricity (like washing and drying laundry, grinding coffee beans, etc.)

From community...

Earthaven Ecovillage is an entire community dedicated to sustainable culture living off the grid in the Black Mountain/Old Fort area. Both micro-hydro and solar photovoltaics are used as power sources.

"We have about ten different residential neighborhoods, some quite densely populated and some with just a couple of folks. The densest neighborhood just created its own photo-voltaic micro grid. In other neighborhoods, where people live close together, photo-voltaic systems are often shared," says Arjuna da Silva, resident at Earthaven.

Da Silva utilizes 1000 kW battery system with four panels on the roof of her home at Earthaven.

"Everyone here learns quickly to shut it and/or shut it off – things our old dads told us when we were kids! Everyone learns to notice the weather, to read a power meter and understand their own system's potential. One becomes accustomed to regulating use according to weather reports!" da Silva says.

...to a tiny home in the woods.

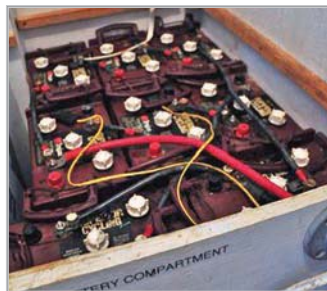
Laura M. LaVoie is a freelance writer and blogger living with her partner in a tiny home nestled in the woods surrounding Asheville. Her home is 120 square feet, as reflected in her blog name, 120squarefeet.com. A two-panel off-grid solar system powers their dwelling.

"Our system is small but it runs everything we need including lights, laptops, and charging stations," says LaVoie.

The couple pursued a simple lifestyle in order to cultivate financial freedom. "By building a tiny, off-grid house not only did we eliminate our mortgage but we also eliminated our utility bills," LaVoie says.

A Happy Medium

It is possible to have the best of both worlds – a grid-tied system with battery backup. These systems are designed to function mainly as a conventional grid-tied system would, but offers emergency power in the event of an outage, delivered via battery. Net metering can be



employed in this application, and the system will function similarly to conventional grid-tied systems, while also allocating energy to charge the battery bank.

"When power outages have occurred the transition has been absolutely seamless, and usually I did not know there had been an outage," says Mary Erickson, who had a battery backup system installed in her home in the Asheville area because she worked from home and had her elderly mother residing with her.

According to solar companies local to Asheville, many customers opt for this kind of system as opposed to going completely off-grid because the conveniences of grid access are ample.

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Zachery Adam became an independent mortgage lender after years working for big banks in the lending industry. Now the Branch Manager of Prime Mortgage Lending of West Asheville, Zack can find the perfect mortgage loan for his customers from a wide variety of products. A deeply committed family man, he follows his bliss: helping people buy their homes while doing what he can to enjoy, protect and preserve the environment.



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