

THE UNIMAGINABLE FUTURE OF RENEWABLE ENERGY

Off-grid vs. grid-tie?
Both? Neither!

by Christopher Freitas

What will be the most common type of renewable energy system of the future—off-grid or grid-tie? My usual answer is, “Both,” meaning that there will just be more of each type, depending on the circumstances. But lately I have realized the most common renewable energy (RE) system of the future might actually be neither of these.

Take computers as a parallel example. Back in the early 1980s, the big question among computer geeks was whether computers of the future would be personal or mainframes—both were available and being used in ever-growing numbers. The interesting part is that neither solution ended up dominating. Something else did—the Internet, an amalgam of both personal and mainframe computers, as well as many things we never imagined. And when you’re viewing a Web site through a wireless Internet connection, for instance, it doesn’t matter what kind of computer you’re using.

Renewable energy systems are similar—we really can’t imagine what the future will look like. The eventual widespread system will probably end up as a mixture of both off-grid and grid-tie technologies coupled with some new ideas few have imagined yet. In the future, the terms “off grid” and “grid tie” may just be relics, just as “personal” and “mainframe” are to surfing the Web.

Blast to the Past

Most new technologies first become popular with extreme or fringe applications. With RE, it was independent-minded back-to-the-landers who wanted off-grid systems in remote areas and dedicated environmentalists who wanted to reduce their environmental footprint with batteryless grid-tie systems. But these two markets are very limited in size. The majority of people are “in the middle” and will require more benefits and features to get motivated to spend the money and time to incorporate renewable energy into their daily lives. The solution they choose might be very different than what is currently available, possible, or even legal.

We don’t always notice the scale of the changes that occur around us during our lives. As a young child, I remember turning over the telephone to find a sticker on the bottom that said, “Property of Pacific Telephone.” When I asked my father about it, he informed me that everyone leased their telephones from the phone company and paid a monthly fee for each phone used. He emphasized that you could not just take any old phone you found and plug it into the phone lines—it might damage the phone network. I also remember that when the first fax machines and personal computers were being used, the phone company required you to have special “data” phone lines installed with extra fees attached. Consumers had no choice in who provided their phone service—there was no competition.

Today, Pacific Telephone doesn’t even exist and consumers now have a choice of phone service providers. Nobody leases their telephones from their service providers anymore. You

can plug a fax or computer into a wall jack without causing the phone system to crash. And your “local” service provider might be located in an entirely different part of the country. Yet it all still seems to work fine and, thanks to competition, prices have dropped. The latest trend is to forego traditional hard-wire phones at home. Instead, many people use cell phones or Internet-based phone services. Both wireless and networked solutions coexist side-by-side and also work together.

Fast Forward to the Future

Today’s utility companies remind me a lot of the old phone companies. They have many people convinced that permission is needed to connect renewable energy sources to “their” grid, which was actually paid for by the consumers under the utilities’ monopoly status. The utilities view renewable energy as a competitor—something they need to control if they have to allow it. And, just like the telephone companies used to do, they want to require special rules and additional fees for using RE. At some point, utilities will realize that they should not only allow the widespread use of renewable energy, but that their very existence requires that they embrace it or face extinction, just like many of the old telephone companies that were slow to change.

The most common RE system 20 years from now might be something that is just as unimaginable as today’s Internet was three decades ago. Future-flexible RE systems might connect to a utility network when it makes sense to but also be able to work independently. There might even be independent “open” power networks similar to today’s wireless networks, where people can distribute the energy produced by their RE systems to their neighbors or provide RE access to those less economically able to afford it. And the role of the utility in the future might be very different than it is now—if they still exist at all.

“At some point, utilities will realize that they should not only allow the widespread use of renewable energy, but that they must embrace it or face extinction.”

Beyond utilities, getting people to embrace and utilize renewable energy will require a completely different relationship with electricity—how it’s consumed and what its role is. This might sound like a quantum leap, but changes happen all the time—in fact, they are inevitable. The renewable energy industry needs to seek out, invent, and take advantage of all new opportunities to reach more people and make RE a part of everyone’s daily lives.

Access

Christopher Freitas (cfreitas@outbackpower.com) is a cofounder of OutBack Power Systems, a U.S.-based manufacturer of power electronics for RE applications. Freitas has worked in the RE industry since 1985.

