

ARE MICROGRIDS POWERED BY ON SITE GREEN ENERGY THE NEXT BIG THING?*

The fuel cell and the microgrid can be independent of the central grid or they can be set to kick in when the utility-provided power goes out. They are different from on site distributed generation that directly burn fuels that are used to power whole campuses. The fuel cell efficiency rate is between 40% and 60%, say experts, meaning that for each unit of energy that is input, roughly half is returned in the form of power. But if the waste heat is captured in a co-generation plant, then those efficiencies are about 85%.

Fuel cells work by combining hydrogen and oxygen. That process requires other fuel sources to break apart the elements. Right now, hydrogen is produced mainly from natural gas using steam reformation, which does nothing to limit the reliance on fossil fuels or the infrastructure that must carry them. The end product, however, is emissions free.

According to Navigant Research, about 500 new microgrid projects have been deployed around the world in the last six months. A key reason for on-site generation and microgrids is that total annual cost of power interruptions to the U.S. economy is around \$200 billion.

It is about being reliable and resilient, or quickly coming back from an outage. The biogas that Bloom uses to create electricity is also known as renewable natural gas. It is a substitute for fossil fuels in microgrids.

Bloom is working with Southern Company to power a biogas pilot at a landfill. The company says that its 50-kilowatt Bloom Energy Server began in February and is delivering renewable baseload power into the local grid. Ebay installed about five Bloom Boxes on its main campus. It says that it is now using 15% less electricity, saving it many thousands of dollars. Staples and WalMart are doing something similar with the fuel cell maker.

Meantime, the city of Phoenix, Ariz. is taking raw biogas produced at its wastewater treatment plant and cleaning it before it is compressed and injected in natural gas pipelines. The city is converting an existing resource into energy that would otherwise get sent into the atmosphere and create greenhouse gas emissions. The conversion process has a cost associated with it, which means that renewable natural gas is more expensive than natural gas. But Bakas points out that using cleaner energy provides not only an environmental benefit but also an economic one, as the cost of the technology falls.