

VISION

STRATEGY

REALITY

Is perfection possible?

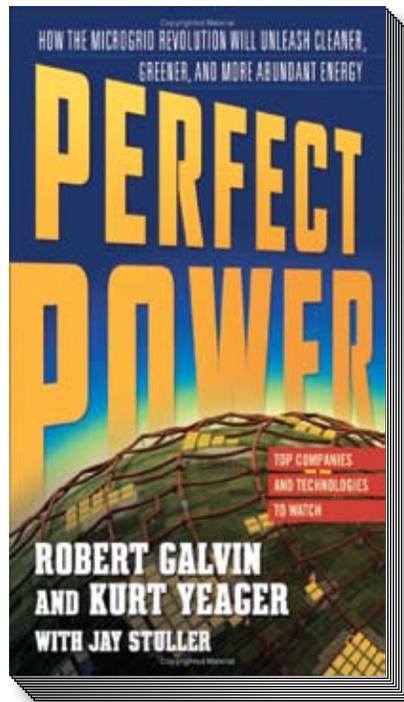
+ KURT YEAGER DISCUSSES MICROGRID POSSIBILITIES

➔ IMPROVING SUBSTATION INTELLIGENCE, OPTIMIZING NETWORK management systems and introducing more automation can help build grid intelligence. The Galvin Electric Initiative, however, argues that current efforts to optimize power systems are limited if utilities only design and create solutions bounded by central generation on one end and the meter at the other.

The Galvin Electric Initiative—founded by Robert Galvin, the former chairman and CEO of Motorola who pioneered the “Six-Sigma Quality” concept—is pushing for “perfect power” or an electric system that is trouble-free and never fails the consumer. According to the Initiative, a key piece of perfect power is not just optimizing power systems, but installing the distributed microgrid power systems or “smart microgrids,” which are small, local modernized versions of the electricity grid. “The whole idea of a microgrid is to eliminate this arbitrary wall or boundary between the supply and the demand side of the system so that the supply and the demand side are operating in unison and in conjunction with one another,” said Kurt Yeager, executive director of the Galvin Electric Initiative.

MICROGRID BASICS

These microgrids could serve a single building, a cluster of buildings or even an entire community. Overlapping individual microgrids could ultimately share power with each other and sell excess power back to the grid. Key components within microgrids could include distributed generation, electric energy storage and advanced building systems. The Galvin Electric Initiative is working on microgrid projects at Mesa del Sol, a master-planned community in Albuquerque, N.M., being developed by Forest City Covington LLC, and at the Illinois Institute of Technology.



▲ *Perfect Power*
By Robert Galvin,
Jay Stuller, and
Kurt Yeager

WHAT MICROGRIDS MEAN FOR UTILITIES

To better explain the microgrid concept, the Galvin Electric Initiative has produced the book *Perfect Power*. This book is not only geared toward informing electricity consumers about microgrids, but also helping utilities understand what impacts microgrids could have on them. “Microgrids wouldn’t change the traditional infrastructure of a utility distribution network in any notable way,” said Yeager. “It’s really focusing on the consumer interface with the distribution system and applying smart technology at that interface so that there is an instantaneous and continuous two-way flow of both energy and information.”

Even though microgrids focus on the consumer side and would not significantly impact a utility’s traditional infrastructure, utilities would ideally have to modify the current intelligence they have on the grid. “The idea would be to put as much of the electronic control starting at the substations and moving down the line from there,” said Yeager. “We need electronic controls and real-time communication so that the distribution system was as reliable as possible. The issue here is reliability, and the less we do of that, then the more distributed generation we have to build into the microgrid in order to back up the power grid when it inevitably goes black on us.”

RESPONSIBILITY FOR MICROGRIDS

Although utilities would have to make some investments, third-party companies would typically be responsible for designing and installing these microgrids. “These can be small or large companies that basically would incorporate the smart technologies to optimize service to a group of consumers,” Yeager said.

“Although some utilities certainly can do this as well, by and large the rules don’t permit utilities to work on the consumer side of the meter. I call the meter as we know it today, the iron curtain of electricity. Consumers and utilities are trapped on either side of it. We need to break that down.”

In terms of accountability for microgrids, utilities and consumers do have many options. “Accountability of the system to both the utility and, more importantly, to the consumer would be through the entrepreneurial third-party organization that would basically be responsible to maintain it and be held accountable by the consumer and the utility to do so,” Yeager said. “So, in some cases, the utility could contract with a third party who would provide these services or the consumer could contract with them directly.”

FINAL THOUGHTS

Third-party providers would likely play a key role in developing microgrids, but that does not mean that utilities have to be left in the dark on such projects. “The whole idea here is not to compete with utilities, but to work with utilities,” Yeager said. “Where we are doing this most effectively is in those cases where it is a collaboration with the utility and the utility is making upgrades and improvements to its distribution system so that it can get the full benefit of the microgrid and the use of distributed generation. Time-of-use pricing is also an absolute essential here. You have to have real-time pricing signals that are going out to all the devices so consumers don’t have to look at price signals. Basically, the system is programmed to adjust electricity use automatically to whatever level the consumer wants.”

Humor break: Smart grid blah de blah

+ By Carol Ray with contributions from Patti Harper-Slaboszewicz

➔ EVERY WHITE PAPER AND PRESENTATION ABOUT THE SMART GRID SEEMS to include some explanation of what the smart grid is: “Smart grid must include advanced metering and distribution automation and” ... blah de blah. It sounds so easy. Need a smart grid? Start with a network, add smart meters and meter data management, interfaces to the back office, two-way digital network paths, sensors and some other whiz-bang expensive stuff and you’re done!

Imagine a commercial, similar to a recent insurance company advertisement where people pull smart grid solutions in colorful boxes off the shelf, load up their shopping cart and off they go, assisted by the friendly agent with “a tricked out nametag.”

A smart grid store of the future would have numerous aisles labeled something like this:



- ▮ Distribution automation
- ▮ Metering solutions
- ▮ Network components
- ▮ Meter data management & unification
- ▮ Home area networks (no TDSPs allowed)
- ▮ Systems integration
- ▮ Outage management
- ▮ Sensors, circuit closures & responders
- ▮ Magic potions and charms