



Microgrids: Fact or Fiction?



Dr. Mani Vadari

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Meet the Author:

An IEEE Fellow, electricity industry visionary, and leader, Dr. Mani Vadari delivers strategic services to a global set of utilities, vendors, and service providers seeking deep subject matter expertise in setting the business and technical direction to develop the next-generation electric/energy system. As a Business Architect, Dr. Vadari has been delivering solutions focusing on Transmission/ Distribution/ generation operations, Energy markets, and Smart Grid for over 35 years. In addition, he is an Adjunct Professor at Washington State University and an Affiliate Professor at the University of Washington. He has published two popular books, "[Smart Grid Redefined: Transformation of the Electric Utility](#)" and "[Electric System Operations – Evolving to the Modern Grid, 2nd Edition](#)", in addition to over a hundred industry papers, articles, and blogs. His books are serving as textbooks at several universities in the US and around the world

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Energy Editor, Transmission & Distribution World, President, Inception Energy Strategies Transmission & Distribution World's IdeaXchange experts address the opportunities and benefits microgrids represent for utilities.

The question is this – Fact or Fiction: Do Microgrids represent a real opportunity for utilities and if so what will utilities need to do to realize the benefit?

We had a tremendous response to our question on Big Data (<http://tdworld.com/smart-grid/big-data-big-bust-0>). We received so many well thought out and insightful comments. Now we would like to consider another topic. Microgrids are attracting great attention these days. According to a Utility Dive study (<http://www.utilitydive.com/news/surprise-97-of-utilities-see-microgrids-as-a-business-opportunity/289045/>) 97% of utilities surveyed say that they see microgrids as a "viable business opportunity." Our own Johan Enslin weighed in on the topic in a recent article entitled "Are Microgrids a Myth?" (<http://tdworld.com/smart-grid/are-microgrids-myth>). Johan closed his commentary by stating "...microgrids, with all of their promises, will surely fade into an interesting experiment if we don't get a solution to the future utility business model."

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Microgrids present a real opportunity. The major reason for its existence is so that all or much of the control is local thereby potentially increasing the chance for more reliable power delivery to the home.

This may or may not be more economic; in fact, everything we know so far has confirmed that centralized sources of power are much cheaper. However, if you take the conversion process of coal into energy and the losses from transmission and distribution, the overall efficiency factor from source to consumption is about 33%. This means that the barrier to entry is not that high for other sources of energy if their price or performance is brought up a little more.

However, right now, much of the justification for microgrids is based on reliability, which means that for more reliable power, people are willing to pay more. This is even more prevalent in second- and third-world countries where the power supply is not that reliable – virtually every apartment complex and/or hotel and/or commercial complex has their own localized control mechanism to keep critical loads operational upon loss of utility-side supply which at times can happen several times a day.

I hear too much discussion about potential lost opportunity for the utility, as if the advent of the microgrid will somehow take opportunities (or customers) away from the utility. That is simply not true. I believe that this is a true opportunity for the utility to take advantage of the vast resources it already has right now and focus on making special accommodations for customers who require greater reliability and are willing to pay more for it – introducing the next-generation microgrid.

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As technologies such as storage and forms of distributed renewables become cheaper, it is easier to see more and more sources of supply at the last mile of the distribution system. This means that there is a possibility, at least in the case of a storm or emergency scenario, for parts of the grid to be split away from the main grid and stay capable of operating in a self-sufficient manner for extended periods of time at least until the main grid can be brought back into a viable state. We call this the "Dynamic Microgrid." In this situation, the grid, under normal circumstances, functions as it does today – as a single monolithic entity but with sources of supply at both ends. However, during emergency situations, it has the ability to split itself into multiple microgrids depending upon where the source of supply is and continue operation in an independent manner until everything is back to normal.