Microgrids Create Municipalization Benefits

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June 02, 2014 | 5 Comments

Electric utilities seeking the renewal of their franchises, and politicians seeking municipalization, both ignore the transformative possibilities of the microgrid. Microgrids represent a promising new business opportunity for both existing utilities and new entrants in the electricity business. Microgrid deployment will also provide the same public benefits as municipal control, likely more.

Why Municipalization?

"Across the country," says the *New York Times*, "cities are showing a renewed interest in taking over the electricity business from private utilities." According to one Minneapolis resident "what we pay for our utility bills would recirculate back into the city general fund rather than us paying for corporate jets, multimillion dollar lobbying sprees, lavish executive bonuses, [and] dividends to distant out-of-state shareholders…It is demoralizing that a distant corporate board of directors … gets to decide where our energy comes from by monopoly power…"

Municipal control of electric utilities also allows cities to increase the use of renewable energy, lower prices, and ensure local responsiveness, especially during severe weather events. Boulder, CO and Minneapolis, MN are attempting to municipalize their electric utilities. Both are battling Xcel Energy, an investor owned utility. Davis, CA "is proposing to acquire the PG&E assets within the incorporated boundaries" and operate a municipally owned utility.

For the reasons above, it makes sense for a city whose utility franchise is up for renewal to consider municipalization. LADWP, SMUD, and CPS Energy, in Los Angeles, Sacramento, and San Antonio, respectively, are good examples of relatively well-managed large municipal utilities. The American Public Power Association points out that, "More than 2,000 cities and towns in the United States light up their homes, businesses and streets with "public power" — electricity that comes from a community-owned and -operated utility."

What appears poorly understood, and finds little mention in the media, is that microgrids can achieve the very public purpose cities seek. As such, they represent a "win-win-win" solution for the utilities, cities, and for "climate."

What Business is a Municipality In?

Xcel lays out the arguments against municipalization — increased debt, unrealistic cost assumptions, savings far in the future, long lead time, significant costs in planning, and loss of access to Xcel's R & D resources. Citizens' opinion is also divided. A comment in Minnesota Daily notes: "If the city does spend billions to take over power distribution, I hope they do a better job than they do maintaining and plowing the streets."

As a business strategy professor, I have to ask: What business is a municipality in? Should it be in the electricity distribution business, at a time when the technology is changing rapidly?

The answer need not be: Renew the utilities' franchise for another 20 years. Rather, regardless of whether Boulder, Minneapolis, Davis and others municipalize, they should plan for micro-electric utilities (MEU) for their cities.

Municipalization: Yesterday's Solution

Municipalization may be yesterday's solution to yesterday's problem. It belongs to the pre-distributed generation (DG), kilowatt hour era. The fight is no longer between Investor Owned Utilities (IOU) and municipal systems — it is also among a host of new entrants in the business.

Today, innovation and technical progress has made exclusive utility franchises over large markets obsolete. As a result, the industry structure, based on "natural monopoly" arguments, does not hold, except for distribution in smaller and smaller geographies. Why? Because of decreasing relevance of scale economies in the electricity value chain. Even town- and village-sized systems may be too large.

How small can we get? One argument is that solar panels with battery, or small gas-generators, may permit homes and small businesses grid independence, economically. Between this home-level solution and today's mega-grid are microgrids.

If electricity providers require relatively small markets, then the businesses of the future may be local, and community-centric. In this respect, electricity is different from telecom, railroads, or inter-state highways that benefit from large markets, and positive network externalities, that is, "the value of a product to any user is greater the larger is the number of other users of the same product."

How to Foster Micro Electric Utilities?

A July 2013 post on the Rocky Mountain Institute's blog describes microgrids as "small, self-balancing networks that have the ability to fractally break apart from the larger grid for autonomous operation and then seamlessly re-combine to function as part of the whole on demand," and notes that "Demand response and energy efficiency — and increasingly, storage and EVs — often figure prominently in [the] design and operation [of microgrids] to flexibly manage supply and demand requirements…"

Boulder, population 102,000, may be divided into small communities of population roughly 5,000 to 15,000 each, a total of say, 15. Each could be economically served by a microgrid.

Who will own and operate the microgrids? Many could — the existing utility; the municipality of the city; knowledgeable and experienced entrepreneurs; new businesses diversifying into electricity services; or out of region utilities. The barriers to entry are relatively low.

Let us assume forty entrepreneurs, utilities, and businesses offer to build and operate microgrids in the fifteen communities. How do we allocate a community as service territory to a particular provider?

The FCC conducted auctions to divide wireless spectrum, and corresponding Basic Trading Areas (BTA), among contesting telecom players in the mid 1990s. There were ~500 Rand McNally defined BTAs. Multiple providers served each market. How many similar markets can the electricity business support? Even 10,000 quasi-independent microgrids — one Micro Electric Utility (MEU) for about 30,000 people each — may be a conservative estimate. Unlike wireless telecom, electricity would be a local monopoly in its service area; overbuilding is impractical.

A citizen body can choose the supplier, a MEU, for each community. The terms of the franchise may be for five to ten years. Regulation of the MEUs may be by municipal authorities of the community. If the performance is below par, a provider may be replaced.

The process of allocating small geographies to micro-utilities could be by auction; an RFP-driven (Request For Proposal) process may not be appropriate. This is because cities seek multi-dimensional, creative solutions from the bidders — neither price nor conformance alone. In the current state of the industry, giving freer rein to suppliers may yield cities unexpected benefits, rather than all prospects respond to a well-defined RFP.

The public interest lies in having multiple MEUs in the same market — a cluster of microgrids — operating in parallel in neighboring communities. This will ensure low prices, the use of renewables, local control, and competitive benchmarking.

Microgrids for Utilities and Cities

A variety of forces — regulatory, technological, and social — favor microgrids. David Raskin in *Public Utilities Fortnightly* (May 2013) notes, "States have asserted their traditional role as the primary regulators of this industry" relative to federal role. Since states and municipalities have jurisdiction over electricity services, MEUs could spread rapidly, state by state.

Regarding technology, Raskin says, "the electric equivalent of wireless telephony — rooftop solar, a black swan that can deliver *electricity without transmission* — has now come into view" [emphasis added]. Rooftop solar is an element of microgrids, and "electricity without transmission" highlights electricity as a local business, and not always a transmission-based, wide area networking business at all.

How should the utilities respond to the forces buffeting them? Raskin suggests that "Minimizing the cost of electricity that's delivered to load over the bulk power system will…emerge as a critical competitive issue for the industry." Yet no amount of cost reduction or efficiencies within the existing system, can match what a new topology of a cluster of peer-to-peer microgrids could achieve. The hierarchical grid will yield to a federation of inter-connected microgrids.

The strategic challenges for utilities are to restructure themselves for the world of small yet coherent service territories, to explore business models that work, and to implement microgrids. Fighting municipalization may be a distraction. Of course, smaller economical service areas do not mean smaller businesses; a utility may own thousands of MEUs, worldwide.

The strategic challenge for cities is how to encourage and accommodate numerous new and existing service providers.

The telecom industry confronted comparable turmoil and emerged transformed, yet successful. The Electricity 2.0 journey promises to be as thrilling.