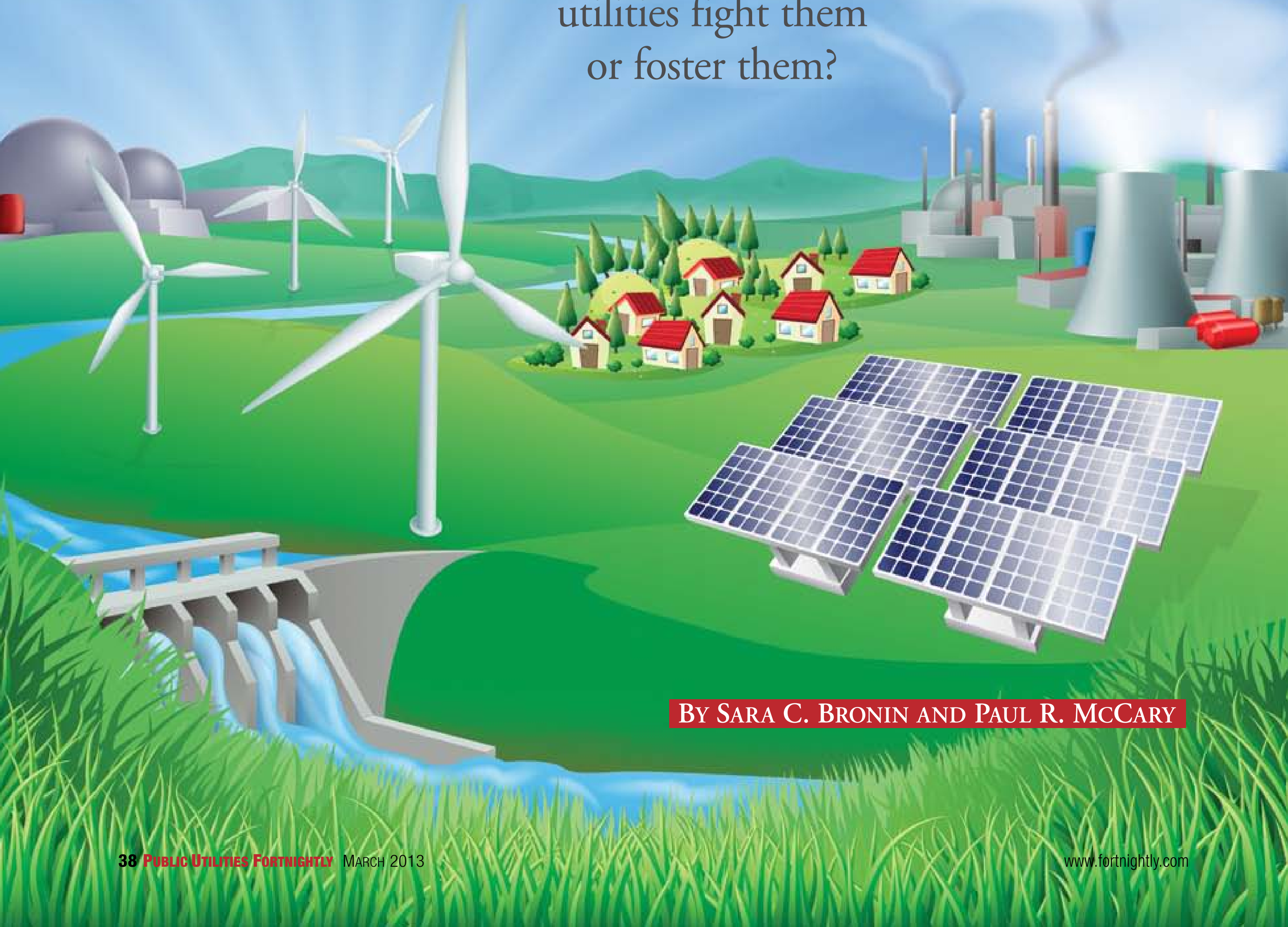
Peaceful Coexistence

Independent microgrids are coming. Will franchised utilities fight them or foster them?



By Sara C. Bronin and Paul R. McCary

The growing push for microgrids in the United States over the last five years has generated a lot of excitement. Those worried about our aging transmission and distribution infrastructure hope microgrids can reduce demands on that grid, while increasing reliability.

Environmentalists and energy efficiency advocates think microgrids can help us both decrease reliance on fossil fuels and improve the way we utilize waste heat. Academics love the concept, because microgrids—an out-of-the-box approach with far-reaching implications on user-utility relationships—provide great fodder for research and commentary. Perhaps most significantly in this struggling economy, a growing number of companies have invested millions in developing software, equipment, and configuration models that will generate even more economic investment if microgrids ever take off.

At the same time, however, microgrids have raised a lot of questions—mostly related to law and public policy—about implementation on the ground. Two of the biggest questions are these: First, how can microgrids with different configurations be integrated into our existing regulatory framework? And second, should utilities resist or embrace microgrids? These questions aren't easy to answer.

Microgrid Drivers

Generally speaking, a microgrid is a small-scale, low-voltage system for sharing distributed generation among several facilities or end users. The most pertinent legal questions today involve microgrids connected to the macrogrid, which are located behind the meter, are interconnected to one or more end use facilities, and can operate in island mode during grid outages. Each customer of a macrogrid-connected microgrid usually remains connected to the local utility system.

Microgrids can include one or more energy generating technologies, including conventional generators, fuel cells, or renewable energy systems such as solar panels or wind turbines. They might or might not integrate combined heat and power; cogeneration, of course, makes a microgrid more efficient because it enables the microgrid owner to capture and effectively utilize waste heat. One or more customers or a third party—such as an electric cooperative, corporation, or nonprofit association—owns the electricity-generating equipment and the dedicated wires linking the loads.

As this description suggests, microgrids offer several benefits for users. Designed with the capability to operate in island mode during grid outages, microgrids dramatically improve reliability.[1]

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Microgrids also can appeal to customers who want to share the output of a distributed renewable resource. Moreover, microgrids are adaptable and can be easily reconfigured to meet users' changing needs. Depending on the ownership rate structure for energy production, microgrids can also be economically beneficial to customers, helping them save money. Finally, microgrids provide users the opportunity to choose their own devices—much like we consumers choose our own mobile devices and TV sets.

In addition, microgrids offer benefits to participants in the macrogrid. Because microgrids are located close to the end user, fewer transmission lines need to be built. In addition, less strain is put on the transmission infrastructure than in conventional configurations, because the microgrids offer stand-alone generation—even if at times the users in the microgrid still draw from the macrogrid.

Possible Configurations

Given their flexibility, the possibilities for microgrid configurations are limited only by technical and legal constraints. Several primary variables are: the number of end users; the number of real estate parcels served by the microgrid; the ownership of the real estate parcels; and whether the microgrid infrastructure crosses public streets. Consider the following five categories:

- *Category 1:* A single end user with multiple facilities on one parcel of real estate owned by that end user. Example: A college campus with no intervening public streets.
- *Category 2:* Multiple tenant end users on a single parcel

1. Connecticut Public Act No. 12-148, An Act Enhancing Emergency Preparedness and Response, enacted in the wake of two major 2011 power outages, including a microgrid grant program to encourage pilot microgrid projects aimed at improving reliability at facilities deemed critical to public safety.

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owned by one entity. Example: A shopping mall owned by a corporation with many retail tenants.

- *Category 3:* Multiple property-owning end users on multiple contiguous parcels, with no intervening streets. *Example:* An industrial park with multiple buildings, where individual buildings are owned by different parties, but with a common overall campus or environment.
- *Category 4:* A single end user with facilities on multiple parcels, with intervening public streets. *Example:* An urban college campus with buildings on different blocks.
- *Category 5:* Multiple end users on multiple parcels with intervening public streets. *Example:* A municipal cluster of a school, a firehouse, and a police station on both sides of a street; or public and private users in a central business district.

Of course, the above configurations don't cover all scenarios and complexities. For example, what about a single end user with facilities on multiple distinct parcels owned within one single block? Or what about microgrids for condo associations, which have multiple property-owning users on one parcel? And what about differences in ownership structures of the actual generating equipment?

However, as limited as they are, these five categories provide ample fodder for analyzing microgrid development possibilities under existing regulations.

Franchise Rules and Regulation

Developing effective microgrids requires a clear understanding of applicable franchise rights and the microgrid's exposure to economic regulation by utility commissions. Franchise rules will govern the extent to which a non-utility owner can distribute electricity and install facilities in public streets. The applicable definition of a "public utility" will determine the extent to which the microgrid activity will subject the sponsor to classic economic utility regulation by the state utility commission. Because the typical microgrid sponsor seeks greater reliability—not years of controversy—the project sponsor needs to minimize franchise encroachment litigation from the local electric utility and exposure to economic regulation by the relevant public utility commission. An early assessment of both risks is essential.

Avoiding the pitfalls of franchise litigation and utility regulation requires either a local legal utility franchise framework that's liberal, or a local electric utility that's open to partnering with customers. Without one of these ingredients, microgrid project sponsors will be limited to small projects within a very restricted footprint. With one or both of these elements, microgrids have enormous potential. Project sponsors fortunate enough to be served by an electric utility that's open to new pricing models might be surprised at the potential for collaboration.

Franchises vary widely from state to state, as does the definition of a utility subject to state public utility commission regulation. Some franchises are granted by state law; some are granted by municipalities. The typical franchise authorizes the utility to install facilities in public streets. Some franchises are exclusive; some aren't. Commission jurisdiction is sometimes triggered by the simple sale of electricity from one party to another. In other cases, the installation of facilities in public streets triggers commission jurisdiction.

To gain a sense of the broad range of state utility laws, consider the examples of South Carolina and Connecticut. In South Carolina, the simple sale of electricity from the owner of solar panels installed on a rooftop to the host end user results in public utility commission jurisdiction over the sale.[2] By contrast, the Connecticut Supreme Court has ruled that, so long as no facilities are installed in public streets, extending a distribution wire from one parcel to another and selling power across that line doesn't encroach on a utility franchise.[3] Nor would this configuration trigger commission jurisdiction.[4] And there are obviously a host of examples in between these extremes.

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A key element of any utility franchise is whether it's exclusive—*i.e.*, whether the existence of the grant itself preempts any overlapping authority. In Connecticut, for example, longstanding case law establishes that: 1) franchise grants are construed against the utility;[5] 2) a franchise grant is not exclusive unless the legislative grant expressly so states;[6] and 3) even »

2. South Carolina defines "electrical utility" as "persons and corporations … owning or operating in this State equipment or facilities for generating, transmitting, delivering, or furnishing electricity for street, railway, or other public uses or for the production of light, heat, or power to or for the public for compensation…" S.C. Code Ann. § 58-27-10(7). By statute, the "public" includes any limited portion of the public, including a person, corporation, or municipality. S.C. Code Ann. § 58-27-10(6).
3. *See Texas Ohio Power v. Connecticut Light and Power*, 243 Conn. 635, 651 (1998).
4. Connecticut statutes define "electric distribution services" as "the owning, leasing, maintaining, operating, managing or controlling of poles, wires, conduits or other fixtures along public highways or streets for the distribution of electricity, or electric distribution-related services." Conn. Gen. Stat. § 16-1. Unlike the situation in South Carolina, it's common in restructured states like Connecticut and Massachusetts for developers to install and own on-site distributed generation, such as solar or fuel cells, and sell the power back to the end user on the premises.
5. See *Hartford Bridge Co. v. Union Ferry Co.*, 29 Conn. 210 (1860).
6. See *City of Groton v. Yankee Gas Services Co.*, 244 Conn. 675 (1993).

utilities with non-exclusive franchises have the right to be free from unauthorized competition.

The practical outcome of these principles is that electric utilities in Connecticut are protected from wildcat grid developers unilaterally accessing public streets for the purpose of distributing electricity, but they have no protection whatsoever from subsequent grants of legislative authority that enable microgrid sponsors to access public streets. While as a general rule the widespread distribution of electricity is most efficient when conducted as a monopoly—no overlapping grants of authority; no duplicate facilities—the microgrid can serve as a limited exception to the general rule.

Possible Configurations

Against this legal and regulatory backdrop, it's easy to summarize the likelihood of successful microgrid development for our five categories of microgrids.

Even in a state like South Carolina with restrictive rules concerning commission jurisdiction, a Category 1 microgrid passes muster without utility collaboration. This simple microgrid involves neither a sale of electricity nor any power lines that cross property lines. Indeed, college campuses have been using cogeneration and district energy for years, and more are turning to more efficient centralized services as energy efficiency technology improves and energy prices rise.

In Category 2, we have a sale of power from the generation owner to the other tenant entities, but no wires that cross property lines. This configuration should work in many jurisdictions—but don't try it in South Carolina. However, this configuration is subject to other rules that would apply both to microgrid projects and non-islanded energy facilities—most notably, submetering rules. The ability of the owner of energy generating equipment to submeter tenants for their usage is prohibited in some states, but energy efficiency proponents are increasingly advocating submetering as a means to increase user incentives to conserve energy and to use renewable distributed generation.

The Category 3 microgrid requires both sales of electricity and wires that cross property lines. This combination would be open to challenge in many jurisdictions. It would appear to be lawful at least in states like Connecticut that lack restrictive franchise rules.

Category 4 is of special interest, since there's no sale of electricity, but there are facilities in public streets. This access—essentially a license to encroach upon a public right of way—would need to be specially granted by the town, county, or state that had authority over the highway. Whether an aggressive utility could challenge this configuration would depend upon the nature of the local franchise and state regulations on point.

A Category 5 microgrid (selling electricity over wires in public streets) could best be developed either by an entity possessing atypical legal powers, such as a municipality (in many states municipalities or counties have the right to own and operate electric utilities),[7] or by a customer fortunate to be served by an open-minded utility. This type of microgrid has significant potential for critical facilities owned by different parties, both public and private, clustered in central cities.

Utility as Microgrid Partner

A microgrid sponsor whose project falters over either conflicting franchise rights or the prospect of commission regulation can still have a successful project if the local electric utility and the commission see the value in facilitating microgrids. Take the example of an urban health care facility with on-site cogeneration to serve its electric and steam loads. Adding a neighboring city emergency shelter as a backup electric customer requires both a sale of electricity and the installation of wires in public streets, putting the project in Category 5. The local electric utility learning about this microgrid can either go into defensive mode, threatening franchise infringement litigation and enlisting the commission to raise the specter of regulation, or it can view the project as a new opportunity to serve its customers and increase its earnings.

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How would the utility exploit the earnings opportunity? It can own the interconnecting facilities that lie within in public streets and charge the microgrid sponsor for use of those facilities. The rate would be calculated using the classic cost-of-service pricing model, but applied to the microgrid facilities on a standalone basis. Thus, the usage rate would be a fixed rate equal to a return of and on the net book value of the facilities lying in public streets—original cost less depreciation—plus the associated operation and maintenance (O&M) expenses and local property taxes associated with those facilities.

This familiar approach overcomes the franchise and commission regulation hurdles posed by the project's configuration. It keeps the public streets as hallowed ground where only utilities may tread. It also allows the utility to increase its earnings by recovering a rate-base type return on the facilities lying within the public right of way. Finally, this pricing shouldn't disadvantage the microgrid sponsor, because the usage rate—cost of money, depreciation and O&M—shouldn't be materially different from the sponsor's costs for those same items.

7. *See, for example*, Conn. Gen. Stat. § 7-213 *et seq*.

In some cases, utility financing of these facilities might be welcomed by the project sponsor because it eases the financing burden for the project. And other customers of the utility aren't disadvantaged by the incremental cost structure. After all, the microgrid, as a dedicated loop serving a small handful of customers from a distributed generation source—in this case combined heat and power—isn't typically using the larger utility grid. Microgrid customers shouldn't have to pay for those embedded investments in their microgrid rate, but presumably they would remain connected to the grid and pay their fair share of embedded costs in their regular distribution rates.

Of course, franchise rules and public utility commission jurisdiction aren't the only issues that microgrid project sponsors must consider. Safety codes and related standards must be respected for all construction and operation. Some configurations might test the limits of a customer's right to backup power under PURPA—the Public Utility Regulatory Policies Act. Other configurations might trigger submetering concerns.

Interesting New Work

Despite their benefits, microgrids have proven to be controversial in some contexts. Non-utility infrastructure serving multiple users creates tension with the classic electric utility model that relies on monopoly distribution rights. Microgrids create the potential for legal battles between the project sponsor and the local utility, but they also open up some fascinating opportunities for collaboration.

At this point, the biggest issues appear to be in the legal and public policy realm. The technical issues, like how microgrids will physically connect to the grid, have in large part been resolved, although more utility-specific adjustments will be needed. If the local utility seeks to challenge and thwart microgrids as an erosion of cherished franchise rights, there will be lots of work for attorneys. On the other hand, if the utility sees microgrids as another opportunity to serve customers while earning a reasonable return on investment, the engineering and finance departments will have lots of interesting new work.