

The Role of Municipal Utilities in Driving Solar Deployment

The domestic solar industry's story continues to be one of overall success. Recent market analyses reveal that the U.S. nearly doubled its cumulative installed solar capacity over the course of a single year, with the industry adding 3.3 gigawatts (GW) of new photovoltaic (PV) capacity in 2012.¹ This positive national picture, however, obscures a large disparity in solar market development between states. As of the end of the third quarter of 2012, just three states accounted for nearly two-thirds of total PV capacity in the nation.² This uneven growth is the result of (at times vastly) different state and utility policies and incentives for solar energy, variations in available solar resources, and the difference between the price of solar electricity and that derived from conventional sources. States have very uneven approaches to solar policies: approximately one-third of states have a renewable portfolio standard (RPS) with special provisions for solar or distributed generation,³ less than one-half of them have authorized third party ownership models that help reduce the up-front cost of solar for consumers,⁴ and one-in-seven have inconsistent net metering specifications between utility types.⁵ Utilities, on the whole, demonstrate a similar relationship with solar. Though some utilities have embraced solar – making it the fastest growing electricity source for utilities in 2011⁶ – this growth has been uneven from utility to utility, even within the same state.

Municipal utilities are self-governed and subject to less state regulatory oversight. They can act more quickly, innovate in new ways, and aren't subject to the same cost-benefit metrics that investor-owned utilities might be. Municipal utilities have been at the forefront of solar development in many ways, ranging from early incentive programs to recent community shared solar programs. This brief explores the nature of municipal utilities and how their governance grants them the flexibility to pursue solar independently, examines the advantages and disadvantages of municipal utilities, and provides examples of policies and incentives some public power utilities across the nation have implemented to drive solar deployment.

What is a Municipal Utility?

Utilities are typically classified into groups based on who owns them. In the U.S., the majority of utilities can be divided into three groups: investor-owned utilities, electric cooperatives, and municipal utilities.

- *Investor-Owned Utilities* (IOUs) are private businesses that work to generate profits that are distributed to shareholders. In terms of number of customers served, IOUs are by far the largest type of utility – in 2011, they served 67% of U.S. customers with over 2 billion megawatt-hours (MWh) of electricity.⁷
- *Electric Cooperatives* are private entities that are governed by their customers and operate “at cost”, meaning they are not-for-profit enterprises.⁸ These co-ops account for 14% of electric customers and over 400 million MWh worth of annual power consumption.⁹
- *Municipal Utilities*, also known as “public power utilities”, are owned and operated as not-for-profit ventures by local governments.¹⁰ Municipal utilities provided over 560 million MWh of electricity in 2011, satisfying 15% of the nation's retail demand for electricity.¹¹

Though municipal utilities account for far less power and fewer customers than IOUs, they by far outnumber them. In 2011, there were nearly 1,950 municipal utilities, compared with approximately 215 IOUs. These public power utilities vary greatly in size – some serve only a handful of customers, while the largest municipal utility (the Los Angeles Department of Water & Power) provides electricity to nearly 1.5 million consumers.¹² Municipal utilities and IOUs also differ in terms of how they are regulated. Through public service commissions (PSC) or similar bodies, states exercise a large degree of control over an IOU's operations, including approving retail electric rates charged to consumers, enforcing safety and reliability standards, defining service territory and services offered, and overseeing other activities and policies.¹³ Authority over municipal utilities, however, generally rests with local officials rather than with state regulatory bodies. States do exercise some control over municipal utilities, however, through the municipalization laws they have in place. Though the specific provisions of these laws differ between states, they general govern (1) whether a municipality within the state may establish a utility, and (2) how the prices of any facilities purchased from an existing IOU should be determined.¹⁴ In addition, most states have adopted interconnection standards or guidelines and net energy metering rules that may apply to municipal utilities.

Advantages and Disadvantages of Municipal Utilities

While there are many general benefits associated with municipalization, the significant investment of time, effort, and capital required to start a municipal utility can severely limit their feasibility. This section briefly explores the pros and cons of municipalization.

Advantages

- Opportunity to Lower Rates – Anecdotal and statistical data both suggest that, while this may not be true in all instances, municipal utilities often provide their customers with electricity at lower rates than those offered by incumbent or neighboring IOUs. Case studies commissioned by local, regional, and state authorities across the nation have documented these cost advantages. A report commissioned in 2010 by the Massachusetts Department of Energy Resources noted that, between 2004 and 2008, “municipal utility rates in Massachusetts have been substantially lower, on average, than IOU rates.”¹⁵ An older report prepared by the Bay Area Economic Forum found that municipal utilities in California provided electricity to customers at lower average prices than those offered by IOUs in the state.¹⁶ More recently, a feasibility study performed pursuant to Boulder, Colorado's interest in establishing a municipal utility determined that municipalization would deliver modest rate savings to customers across all market segments.¹⁷

While the most recent publically available data on utility retail prices continue to suggest that municipal utilities in Massachusetts, California, and Colorado (as well as in some other states) offer customers lower average prices than IOUs in these states, locally-owned utilities are not always able to offer lower rates. Table 1 on the following page lists average retail prices faced by customers of both municipal and investor-owned utilities in each of the nine U.S. Census regions that represent the contiguous 48 states. As can be seen in the far right column of the table, only a few regions have municipal utilities offering lower average prices than IOUs. Nationally, however, municipal utilities have a slight price advantage (\$0.0957/kWh) over IOUs (\$0.1003/kWh).¹⁸

Table 1: Comparison of Average Municipal and Investor-Owned Utility Prices, 2011ⁱ

<i>Census Region</i>	<i>Average Municipal Prices (\$/kWh)</i>	<i>Average IOU Prices (\$/kWh)</i>	<i>Muni Rate:IOU Rate</i>
New England (CT, ME, MA, NH, RI, VT)	0.1333	0.1510	88.27%
Middle Atlantic (NJ, NY, PA)	0.1607	0.1499	107.20%
East North Central (IL, IN, MI, OH, WI)	0.0924	0.0969	95.36%
West North Central (IA, KS, MN, MO, NE, ND, SD)	0.0828	0.0795	104.15%
South Atlantic (DE, DC, FL, GA, MD, NC, SC, VA, WV)	0.1005	0.0939	107.03%
East South Central (AL, KY, MS, TN)	0.0935	0.0828	112.92%
West South Central (AR, LA, OK, TX)	0.0852	0.0746	114.21%
Mountain (AZ, CO, ID, MT, NV, UT, WY)	0.0877	0.0867	101.15%
Pacific Contiguous (CA, OR, WA)	0.0932	0.1245	74.86%
Nation	0.0957	0.1003	95.41%

- Local Control Over Programs – Municipal utilities are managed by local government officials, who are elected by and therefore accountable to the citizens in the community. Because these citizens are also customers of the utility, there is a greater opportunity for individuals to influence the utility’s operations. This citizen influence helps ensure that the officials governing the municipal utility are more aware of their customers’ needs, and that the utility will offer programs and services to meet these needs.¹⁹
- Fewer Regulatory Hurdles – The lack of state control over municipal utilities translates into a less burdensome regulatory process. Because new programs do not require approval from state regulators, municipal utilities are able to implement them faster than initiatives developed by IOUs.
- Increased Responsiveness – The local presence and governance of municipal utilities may translate into increased responsiveness to customers’ complaints or perspectives. Because these utilities are located in the communities they serve, consumers have the chance to discuss their views or concerns with another member of the community, who may be more likely to share their needs and values than a utility employee in another part of the state.²⁰
- Local Economic Development – Municipal utilities are locally owned and operated, allowing for some of the consumers’ energy dollars to remain within the community and support local jobs.²¹ Spencer Municipal Utilities (SMU), serving the City of Spencer, Iowa, provides an example of the economic development potential these utilities hold. In April 2012, the Iowa Area Development Group bestowed its Impact Award upon SMU for its role in conceiving and planning the Green Industrial Center, one of the state’s largest environmentally friendly industrial areas.²²

ⁱ Analysis conducted by The Solar Foundation, based on data provided by the U.S. Energy Information Administration

Disadvantages

- Considerable Infrastructure Investment – Starting a municipal utility requires acquiring the electric generation facilities and distribution systems that will serve the community. Covering these costs often requires the municipal government to take on significant amounts of debt. As there is a wide range in the size of municipal utilities across the country, the magnitude of the financial requirements to start a municipal utility also vary greatly, ranging from a few million dollars to several billion in upfront investment.²³
- Other Budgetary Impacts – While a profitable municipal utility may have a positive impact on city or county budgets (possibly allowing the local government to use utility revenues to cover funding shortfalls for other services), there are a number of potential downsides to having a utility connected to local government budgets. Utilities owned and operated by local governments may sometimes compete for funding with other operations or services. In times of fiscal drought, officials may be tempted to divert funds for utility infrastructure investments to other purposes. Additionally, because these utilities provide governments with another source of revenue, local governing bodies may come to see electric rate increases as a solution to budget challenges, thus eliminating one of the potential benefits of municipal utilities. Such rate increases can also create an inequitable distribution of costs and benefits for local services. Because municipal utility service territories do not always correspond with municipal boundaries, customers outside city limits will be subjected to higher rates without receiving the benefit of the services they support. Furthermore, while shareholder-owned electric utilities may be subject to local taxes and franchise fees, municipalities are not. Municipalization eliminates these revenue streams, which may further strain local budgets.²⁴
- Long and Complicated Process – Fully making the transition from an IOU to a municipal utility can take several years – almost as long as a decade, in some cases.²⁵ Even if a municipality and its citizens are prepared to navigate this complex and lengthy process, there is no guarantee that municipalization efforts will be successful. The City of Las Cruces, New Mexico, for example, spent nearly 12 years pursuing municipalization, only to abandon these efforts in early 2000 once it became clear that it had underestimated the costs of starting its own utility.²⁶
- Power Market Complexity – Successfully navigating the wholesale electric market – and indeed, the electric utility industry in general – can be a difficult endeavor for elected representatives or the utility officials they appoint. Anticipating wholesale electricity rate fluctuations in order to ensure these prices are sufficiently lower than the retail rates offered to customers can be challenging even for industry experts.²⁷ Miscalculating market conditions can undermine the economic feasibility of municipalization or eliminate any cost savings the municipal utility would have otherwise been able to deliver to its customers.

Municipal Utilities and Solar

Two of the main benefits attached to municipal utilities – local control over programs and increased responsiveness – help to ensure that they are attuned to the needs and priorities of their customers. In some sustainability-focused or environmentally-conscious communities, where customers are increasingly concerned with developing renewable energy resources, these positive attributes of public power can translate into effective or innovative initiatives to promote renewables broadly, and solar in particular. This section describes five programs or incentives municipal utilities can adopt, or actions they can take, to drive demand for (or reduce barriers to) electricity generated from solar energy.

- Rebates are direct cash incentives provided to customers who purchase and install solar energy systems. These incentives are typically provided to cover a certain percentage of installed system costs or on the basis of system size (most often in dollars per watt of installed solar capacity).²⁸ When used in combination with federal and any existing state tax credits or other incentives designed to reduce the upfront cost of solar energy, rebates can save customers significant amounts of money.

Rebates are a fairly common type of incentive used by municipal utilities to promote solar. **Dover Public Utilities**, located in and operated by the City of Dover, Delaware, offers rebates to offset the cost of solar installations. Started in 2007, the program was designed to provide municipal customers \$128,000 worth of direct cash incentives annually. One unique feature of this program is that non-profit customers receive twice the rebate amount available to other customers. Additionally, all rebates “step down” based on system size. For example, most customers (excluding non-profits) can receive \$1.25/W for the first 5 kW of installed capacity, \$0.75/W for the next 5 kW block, and \$0.35/W for the final 40 kW. Incentives are limited to \$7,500 for residential customers and \$15,000 for all others.²⁹ Farther north, **Chicopee Electric Light** in Massachusetts provides residential customers with rebates of \$1.25/W (up to a \$2,500 individual incentive cap) for the first 30 kW worth of systems connected to the municipal grid each year.³⁰ On the west coast, **Snohomish County Public Utility District No. 1**, which serves over 300,000 customers in Washington state, offers its own rebate program. Through the “Solar Express” program, eligible customers can receive an incentive of \$500/kW (or \$0.50/W), capped at \$2,500 for residential systems or \$10,000 for commercial systems.³¹

- Loans are another means by which municipal utilities help their customers overcome the high upfront cost barrier to solar. These programs allow for the costs of going solar to be distributed over a longer period of time, breaking what would otherwise be a sizable lump sum payment into smaller, more manageable amounts. Many of the programs administered by municipal utilities offer financing at lower rates than other loan options (such as those available through some financial institutions), which help to keep the overall cost of investing in solar energy through the loan program as close to the system’s value as possible.

The **City of Tallahassee Utilities** in Florida offers low interest loans for a number of residential energy efficiency and renewable energy upgrades, including solar photovoltaic systems. Through the program, customers can borrow up to \$20,000 at a 5 percent interest rate on a loan with terms up to 10 years.³² **Columbia Water & Light** in Columbia, Missouri provides an example of loans for solar water heating equipment. Under the utility’s “Super Saver Loan” program, customers seeking to purchase solar water heaters that will cover at least 50% of their water heating needs can receive up to \$15,000 (residential) or \$30,000 (commercial) in loans at interest rates pegged to the term of the loan. These rates range from 1 percent for loans with terms up to 3 years to 5 percent for loans designed to be repaid in as many as 10 years.³³

- Performance-Based Incentives are a type of direct cash payment based on the amount of solar electricity a system produces. Unlike rebates, which are aimed at reducing the high upfront cost of going solar, performance-based incentives provide system owners with a long-term source of revenue to help improve their return on investment. A long term stable revenue stream may also facilitate the ability of a system owner to obtain financing for a solar

system. In contrast to rebates, performance-based incentives have the advantage of rewarding more productive systems and inducing an added motivation for proper system maintenance. Rewarding performance helps ensure that ratepayer money is spent effectively towards the goal of greater solar energy production.

Among other renewable energy incentives, **River Falls Municipal Utilities** (RFMU), serving River Falls, Wisconsin, created a special rate tariff for customers who agree to sell their system's solar electric output to the utility. Under this "Solar Renewable Energy Buyback Rate", RFMU will purchase 100% of the electricity generated by a system enrolled in the program at \$0.30/kWh for a 10 year period. The program accepted systems up to 4 kW in size, up to the point that total solar capacity added under the initiative reached 10 kW.³⁴ Though this cap may seem small, it is important to keep in mind that RFMU serves only just over 6,000 customers, illustrating that even modestly-sized municipal utilities can help promote solar.

Austin Energy's "Value of Solar Tariff" program is an innovative performance-based initiative designed to replace the utility's net metering program.³⁵ Unlike most performance-based incentives, which are designed to provide system owners with an attractive return on their investment, the Value of Solar Tariff instead attempts to place a market value on the costs and benefits of going solar. The utility employs a special algorithm that factors in the benefits of solar – including system loss savings, wholesale energy savings, new generation capacity savings, fuel price stability, avoided new transmission and distribution infrastructure savings, and environmental benefits – to determine the solar rate.³⁶ The current value of solar rate is \$0.128/kWh, but is recalculated annually to reflect changing market conditions.

- Community Shared Solar provides a means for multiple community members, who may not own property suitable for individual solar development, to enjoy the benefits of solar energy. Community shared solar contrasts with the traditional "one system, one owner" model, in that these programs allow individuals to purchase or lease portions of a larger, centrally located solar energy system. Such initiatives can be sponsored by utilities, non-profits, or businesses formed specifically to develop and manage the project. Program subscribers typically enroll either by making a single, upfront contribution to the project, or by paying for their share of the system in ongoing installments.³⁷

Berea Municipal Utilities (BMU) in Berea, Kentucky offers a solar leasing program in which customers make a single upfront payment to buy in.³⁸ The Berea Solar Farm's 120 PV panels are fully subscribed, but the utility is in the process of accepting applications for an additional 132 panels planned for the near future. The solar farm provides customers who want to invest in solar an opportunity to do so without having to install a PV system on their own property. The ground-mounted system is located on city property, and is owned and maintained by BMU. Customers can lease panels for \$750 each, which entitles them to all the electricity the panels produce for 25 years. Because the utility owns and manages the project, the electricity produced by the panels can be credited to metered residential and commercial customers' electricity bills. This program has been immensely popular, as evidenced by the fact that the first 60 panels were leased in only 4 ½ days. The other half of the system was fully subscribed in just four months.

The **Sacramento Municipal Utility District (SMUD)** offers a variety of incentives for solar, including rebates, leases, and the option to “rent” panels in their community shared solar project. SMUD’s “SolarShares” program provides an example of the ongoing payment option for participation in community projects.³⁹ For a fixed monthly price, customers can subscribe to as little as 0.5 kW worth of system capacity. These ongoing payments are billed to participants’ monthly electricity bills and are partially offset by energy credits received for the amount of electricity their portion of the system produces. The program is open to everyone in SMUD’s territory and participants are able to keep their solar shares membership if they move to a new location in the area.

- Power Purchase Agreements (PPAs) are contracts under which electricity users or distributors agree to purchase electricity from a power generator at a predetermined rate. For a municipal utility interested in supplying its customers with renewable energy, PPAs represent a way of meeting this goal without incurring the large upfront investment required if it were to own the system directly. Under a PPA, project developers cover the capital costs of an energy system, retaining ownership of the equipment along with the responsibility to operate and maintain it. The purchasing party – in this case the municipal utility (though some states allow for homeowners to enter into PPAs) – pays a wholesale rate for the electricity the system produces. PPAs can be (and have been) used by municipal utilities to purchase electricity generated from large-scale solar energy systems.

In July 2012, **CPS Energy** (serving the greater San Antonio, Texas area) entered into a PPA with OCI Solar Power that will support the development of a 400 MW solar energy system – “the largest in the nation among municipal utilities.”⁴⁰ In addition to providing the utility with enough solar electricity to satisfy annual demand for 10% of its customers, the PPA was structured to keep job creation and economic development impacts local. Under the agreement, a \$100 million manufacturing operation will be brought to the San Antonio area, along with over 800 new jobs and \$700 million worth of annual economic activity.

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