# Community Microgrid Ownership Models

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## Introduction

Community resilience is a growing concern given the increasing severity of weather-related events that disrupt electric service to customers for extended durations. Development of microgrids has become an essential part of supporting the resiliency of communities and the energy grid. The US Global Change Research Program's Fourth National Climate Assessment (NCA) recognized microgrids as an effective means of resiliency in the face of natural disasters like hurricanes and wildfires, which are expected to increase in severity and duration over the next century[1]. Category 4 and 5 hurricanes are predicted to increase by approximately 28% by the end of the century, while annual land burned from wildfires is expected to rise by 30% by 2060[2,3]. Along with the greater frequency of natural disasters and major storm events, power outages are subsequently predicted to increase and impact millions of customers a year. Long-term power outages can severely impact the health of at-risk and healthy populations alike and cause billions of dollars in economic damage and loss of productivity, especially as businesses continue to move online. In response, many towns and municipalities are seeking to integrate microgrids into their communities. Initiatives like New York's NY Prize[4] competition and several states' microgrid legislative and regulatory actions[5,6,7] aim to enable communities to pursue microgrids.

*Community microgrids are increasingly being recognized as an effective technology to promote resiliency in small- and large-scale communities alike.*

In particular, community-based multi-user microgrids are emerging as a viable solution.  Community multi-user microgrids are characterized by a set of contiguous loads and energy exporting resources connected using a section of the local utility distribution grid to form a microgrid within a defined electrical boundary[8]. These multi-user microgrids may incorporate private and/or utility generation and energy storage assets that are able to export energy under blue sky and island modes. These community microgrids are distinguished from campus style microgrids in that they do not use the utility distribution system to connect the loads. The scale of a community microgrids can range from a few customers to an entire town, as has been referred to as a mini-grid[9]. Due to the presence of different types of entities involved in a community-microgrid, with differing capabilities and needs, multi-user microgrids are complex and inherently unique to each location.

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[1] https://guidehouseinsights.com/news-and-views/us-government-recognizes-microgrids-as-pieces-in-solving-the-climate-change-puzzle
[2] https://science2017.globalchange.gov/chapter/9/
[3] https://nca2018.globalchange.gov/chapter/6/
[4] https://www.nyserda.ny.gov/All-Programs/Programs/NY-Prize
[5] https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M340/K748/340748922.PDF
[6] https://portal.ct.gov/DEEP/Energy/Microgrid-Grant-and-Loan/Microgrid-Grant-and-Loan-Program
[7] http://www.okenergytoday.com/2020/09/us-house-committee-approves-rural-electric-cooperative-grant-program-bill/
[8] "How to Design Multi-User Microgrid Tariffs," SEPA & Pacific Energy Institute, https://pacificenergyinstitute.org/wp-content/uploads/2020/08/SEPA-PEI-How-to-Design-Multi-User-Microgrid-Tariffs.pdf
[9] https://assets.new.siemens.com/siemens/assets/api/uuid:5294ca04-92e2-4d39-a787-277376bdad42/version:1587982709/91-modernizing-the-puerto-rico-power-grid.pdf

Community microgrids involve the creation of new microgrid ownership and operational models. These new models will need to address the increased microgrid technological and operational complexity, related performance requirements, and risk management among the developer, customers, microgrid operator, and the utility. Additionally, to the extent there are societal resilience benefits beyond those for the participating customers, there is a need to consider appropriate resilience service compensation borne by other utility customers. State legislative action to-date has generally not addressed issues regarding multi-user microgrid ownership and operational responsibilities. As a result, state regulators face upcoming oversight and jurisdictional issues associated with microgrid islanding agreements, privately-run and utility-private partnership multi-user microgrids, customer protection considerations, and tariff development. This paper builds on the earlier SEPA-PEI multi-user microgrid tariff development paper[10] to focus on the current trends in microgrid business models and highlight the associated benefits and challenges.

## Community Microgrid Business Models

Community based multi-user microgrids are typically owned and operated along a spectrum of purely private to purely utility owned and operated microgrids. For simplicity, multi-user microgrids can be considered "private", "utility", or "utility-private" ventures, where each form of multi-user microgrid involves private and/or utility assets and is characterized by the principal investor and responsible operator of the community microgrid.

- Private microgrids involve private generation/storage assets and operational control of the microgrid by the private microgrid operator.
- Utility microgrids would involve utility owned generation/storage and microgrid operational control.
- Utility-private microgrids are those where the utility and private developer(s) each contribute assets and share control responsibilities between the parties.

In all cases, community microgrids use utility infrastructure to connect various customers so use of utility distribution infrastructure is not a determining factor in the owner-operator model for a community based multi-user microgrid. There is considerable variety of potential forms of community microgrids that is best represented by a spectrum as illustrated in Figure 1 below.

[10] "How to Design Multi-User Microgrid Tariffs," SEPA & Pacific Energy Institute, https://pacificenergyinstitute.org/wp-content/uploads/2020/08/SEPA-PEI-How-to-Design-Multi-User-Microgrid-Tariffs.pdf

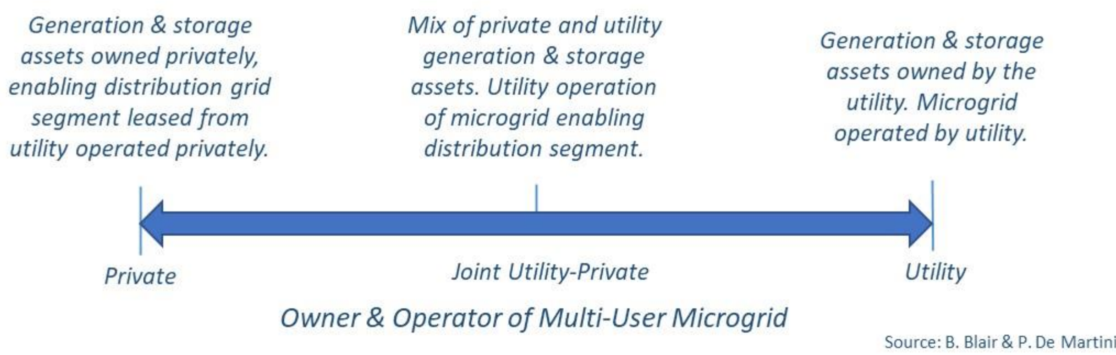


*Figure 1: Multi-User Microgrid Owner-Operator Model Spectrum*

## Private Microgrid Owner-Operator

Due to the nature of multi-user microgrids crossing a utility's infrastructure, privately owned microgrids typically have been barred from becoming operational, largely because the microgrid overlaps the utility's jurisdiction and presents an issue of oversight for the state's public utility commission. In some states, utilities are considered to be all entities with any formal interconnection electrical infrastructure between two or more customers. Under these constrictions, any multi-user microgrid operators would be subject to the same regulations as utilities. In 2020, Maine clarified its operational rules in L.D. 13 that declared that microgrid operators are not deemed public utilities and that the Maine Public Utilities Commission (MPUC) should approve microgrid proposals up to 25 MW if constructed to benefit the public's interest[11]. Maine limited microgrid ownership to those that have the financial and technical capacity to build the grid, the ability to form contractual relationships between the microgrid operator and consumers within the microgrid area, and the ability to meet Maine's renewable portfolio standards. While regulation of private, community microgrids is leaning towards more flexible regulatory oversight, essential questions regarding microgrid monopolization within the electrical boundary, appropriate servicing of all customers within the microgrid, and microgrid operational and safety standards all remain upcoming regulatory issues. The inherent monopoly that microgrid operators experience during islanded modes must be considered under the same restrictions of utility monopolies to ensure equitable and fair customer to operator agreements.

*Monopolization within the electrical boundary, appropriate servicing of relevant customers, and operational & safety standards all remain unresolved regulatory issues for private community microgrids*

Hudson Yards in New York city is a type of private multi-user microgrid which uses ConEdison's distribution lines to connect the commercial retail buildings and residential apartments to the

[11] https://microgridknowledge.com/microgrid-bill-maine-house/

microgrid's CHP generation plant and diesel generators[12]. With the help of ConEdison, Hudson Yards was able to install customer-owned microgrid breakers at the perimeter of the microgrid electrical boundary and keep the utility owned step-down transformer within the microgrid for normal, day-to-day operation and connection to the ConEdison grid[13]. Hudson Yards has maintained operational control of its microgrid in part due to development of a power subsidy that sells energy from the CHP plant to the Eastern Rail buildings and tenants[14]. The power subsidy helps Hudson Yards recoup some of the cost of the microgrid development and the ongoing operational costs. While the Hudson Yards microgrid utilizes ConEdison's distribution grid, this microgrid is considered a private microgrid given that the microgrid project was financed by Hudson Yards, uses customer-owned microgrid breakers, and is operated by a private operator for islanded (grid-disconnected) conditions.

## Utility Microgrid Owner-Operator

Utility owned and operated multi-user microgrids are those where the utility is the sole owner and controller of the microgrid distribution and generation/storage assets. Utility multi-user microgrids may be developed in response to a utility resilience planning identified need or local community request for improved grid resilience. Reynolds Landing by Alabama Power is one such example of a utility-owned and operated microgrid designed for new housing developments. Reynolds Landing is a residential, smart neighborhood designed to model future housing developments in terms of energy efficiency and resiliency[15]. The neighborhood consists of 62 single-family homes connected to a 1 MW microgrid supported by a solar array, battery storage unit, and a natural gas generator, all owned by Alabama Power. As utilities face the burden of providing resiliency services in the face of aging infrastructure and increasing severe weather events, utilities must pioneer new solutions and partnerships to predict future resiliency trends and demands. While the Reynolds Landing microgrid is owned and operated by Alabama Power, the neighborhood developer Signature Homes benefits from the microgrid by increasing the market-value of the homes and the overall popularity of the subdivision; all sixty-two homes sold within the first six months on the market and proved lucrative for Signature Homes[16]. The trend for smart and resilient residential housing has become popular throughout the United States as more customers desire these types of home additions.

The Ocracoke Island microgrid is another example of a utility owned and operated community microgrid. Tideland Electric Membership Corp (TEMC), a North Carolinian electric co-operative, paired with North Carolina's Electric Membership Corporation (NCEMC) to install a hybrid microgrid, consisting of a 15-kW rooftop solar PV array on top of the TEMC-NCEMC's joint 3 MW diesel generator[17]. The microgrid was built to meet the resiliency needs of Ocracoke Island, which is particularly vulnerable to oceanic storms and is serviced by a single submarine transmission line. The microgrid reduces the cost of

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[12] http://nyssmartgrid.com/projects/hudson-yards/
[13] https://www.utilitydive.com/news/coneds-hybrid-service-model-for-large-microgrid-could-become-standard/517413/
[14] https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/using-power-and-technology-to-deliver-resilience-in-hudson-yards
[15] https://www.greentechmedia.com/articles/read/alabama-reynolds-landing-microgrid-grid-edge
[16] https://hooversun.com/news/alabama-power-unveils-innovative-power-system-in-reynolds-la/#:~:text=The%20Reynolds%20Landing%20microgrid%2C%20located,%2Ddriven%20generator%2C%20Leverette%20said.
[17] https://microgridknowledge.com/ocracoke-island-microgrid-dorian/

servicing the island and was built to test residential peak-demand shaving and demand-side management through the use of a PowerSecure battery system and ecobee smart thermostats and smart water heaters. A remote controller operated by NCEMC can control the microgrid in islanding modes. In 2017, a transmission cable failure caused widespread outages to the surrounding area, but the Ocracoke microgrid was able to maintain power for the island community[18].

Utility microgrids are most common in locations where the utility has an economic and technical edge over private development, primarily through the utility's ability to integrate various types of generation assets into mini- and major grids. Utility microgrids also occur where utilities have the operational capacity to manage microgrid assets in both blue-sky and islanded modes that private developers and operators may not have the institutional experience to implement. As illustrated in these two examples, utilization of blue-sky microgrid capacity for meeting a load serving entities' resource and grid needs is essential to earning a competitive return on investment. For utilities that are not subject to statutory or regulatory restrictions on distributed asset ownership, utility multi-user microgrids offer a potentially effective alternative to meeting resiliency needs, renewable portfolio standards, and optimizing grid operations.

Restructured states that prohibit or limit utility ownership of distributed resources have a significant impact on the flexibility of utilities to implement microgrids for resiliency needs and the use of the assets for energy and grid needs under blue sky conditions. The Woods Run microgrid was proposed as a utility-owned microgrid and was challenged due to Pennsylvania's restructuring laws[19]. The Duquesne Light Company proposed the Woods Run microgrid for power outage events, but the ownership of the generation assets by the utility was challenged on the grounds that it violated the Electric Generation and Customer Choice and Competition Act and that the proposed addition of $9 million to the rate base was unfair to customers not supported by the microgrid. The utility withdrew its proposal before the commission could decide on whether the microgrid was of public benefit and added sufficient societal resiliency for the cost. Potential cost-shifts between participating customers and other rate-payers are a concern if no societal benefits are identified.

However, in recognition of broader electricity resiliency needs, the potential for microgrids to assist in grid stability[20], and the unique capabilities that a utility may bring to multi-user microgrids, there is growing recognition of allowing utility ownership and operation of community microgrids in restructured states to meet the scale of need, particularly in vulnerable communities that are historically underserved by competitive developers. This has been addressed in selective cases, where the utility demonstrated community resilience value by serving critical facilities and vulnerable communities, as is

[18] https://www.advancedenergy.org/2018/10/18/north-carolinas-electric-cooperatives-see-the-future-in-microgrids/
[19] http://www.puc.state.pa.us/pcdocs/1590205.pdf
[20] https://microgridknowledge.com/microgrids-spinning-reserves/

the case with PG&E's microgrid installations to address the outage events stemming from wildfire public safety power shutoffs.[21]

## Utility-Private Joint Owner-Operator

Utility-private multi-user microgrids would include all microgrids that have significant utility oversight and investment as well as significant private ownership and financing of the microgrid. Utility-private microgrids will vary in how much input the utility has into the microgrid, but all utility-private ventures will involve some private ownership of generation and microgrid assets with some utility oversight for grid management. Either the utility or the private corporation can be the main proponent of the microgrid, but of the established utility-private microgrid ventures, it is more common for the utility to be the main controller and sponsor of the overall project with some private generation ownership.

Heron's Next Environmental Village is another example of utility-private joint ownership, where the NCEMC and Brunswick Electric Membership Corporation (BEMC) cooperative partnered with the private developers Ollo and The Adams Group[22]. The community solar photovoltaic array and battery energy storage system (BESS) will be owned by Ollo and operated by NCEMC. The microgrid configuration is designed to be optimized in both island and blue-sky conditions where NCEMC can use the microgrid as a demand response asset during peak energy periods. The interconnected neighborhood will also feature residential rooftop solar panels, demand response water heaters, demand response ecobee programmable thermostats, and electric vehicle charging[23].

*Utility-private microgrid ventures leverage the existing institutional and financial capabilities of multiple parties to meet localized community and business needs.*

In many cases, utility-private joint ownership models are a natural occurrence that allow for the utilization of the existing private distributed resources to be leveraged for the localized community and business needs. Globally the Commercial & Industrial sectors are the largest contributors for increasing microgrid demand and investment and already own many of their own, behind-the-meter generation assets. Smart utility-private ventures can more efficiently pair private financial investments and assets with the localized distribution owners and operators. The Rose Acre Farms microgrid, designed to support the local community, is a utility-private partnership among the nation's second-largest egg producer, its local electric cooperative Tideland EMC, and the statewide generation and transmission co-op NCEMC[24]. Rose Acre Farms owns the backup generators, NCEMC owns and operates the solar array and battery and acts as the microgrid controller, and Tideland EMC owns and operates the distribution system for the microgrid. The microgrid is expected to make the local grid more flexible, resilient, and efficient.

Some utilities have already embraced microgrids as a grid infrastructure alternative. SDG&E determined that the single transmission line leading to Borrego Springs, California was insufficient to meet the

[21] https://www.pge.com/en/about/newsroom/newsdetails/index.page?title=20200611_pge_strengthening_community_resilience_with_comprehensive_microgrid_solutions
[22] https://www.prweb.com/releases/oati_to_work_with_ncemc_and_local_cooperative_utility_to_build_a_sustainable_community/prweb16850840.htm
[23] https://www.carolinacountry.com/your-energy/between-the-lines/co-op-tech-life-on-a-microgrid
[24] https://www.electric.coop/nc-co-ops-help-egg-farm-add-microgrid/

town's reliability and resiliency electrical needs and that a microgrid was less expensive to implement than replacing the transmission line. The microgrid consisted of SDG&E's substation and two utility-owned batteries, a third-party commercial 26 MW solar PV array, 3 MW of customer-owned rooftop PV systems, two 1.8 MW diesel generators, and three community energy storage batteries[25]. The microgrid was designed to be operated either remotely by SDG&E or by the local community when in islanded mode. The Bronzeville microgrid in South Chicago, Illinois is another such utility-private venture, where ComEd designed and operated the microgrid and individual, private entities owned the controllable generation assets[26]. Both microgrid projects were required by state regulators to utilize private generation assets as part of the microgrid implementation plan and were subject to regulatory approval for microgrid cost additions to the utility rate base.

Even with some legislative and regulatory pushes to allow for more private investment in community microgrids, the price associated with microgrids is a large barrier for community- and private microgrid development. The Hudson Yards microgrid and ConEdison interconnection cost nearly $200 million, far outside the budget for small towns and communities[27]. In part, this economic barrier can be reduced through utility-private partnerships and through publicly funded programs like the NY Prize program that facilitate partnerships among utilities, private companies, and energy regulators[28]. The creation of the Bronzeville and Borrego Springs microgrids were partially funded by the USDOE because they served as proof-of-concept, utility-sponsored microgrids.

The Bronzeville microgrid utilized $5 million in grants from the USDOE and added $25 million to ComEd's rate base, which was approved by the Illinois Commerce Commission because the "proof-of-concept" design was deemed beneficial for all ComEd customers[29]. Even with the appropriate support, some cities and municipalities find microgrids to be far more expensive than replacing and updating existing infrastructure. Rockville Centre, a NY Prize Stage 2 participant, found that expanding transmission lines and upgrading the existing substations was a cheaper and effective means of improving the town's resiliency needs[30]. The microgrid development would cost over $20 million and would need Stage 3 and other grant funding to be a feasible option for the town[31]. Towns and small communities can partner with utilities to fund community microgrids, but adding a minimum of $10 to $20 million to the utility's rate base can be hard to justify to both the utility and the regulatory commissions, especially if many towns and communities within the utility's geographic system are asking for a twenty million-dollar microgrid. Effective partnerships spread the cost of implementing microgrids and has further pushed the overall market towards the utility-private model.

## Rise of Utility-Private Partnerships

[25] https://ww2.energy.ca.gov/2019publications/CEC-500-2019-013/CEC-500-2019-013.pdf
[26] https://poweringlives.comed.com/microgrid-learnings-critical-to-clean-and-resilient-energy-future/
[27] https://www.hawaiianelectric.com/documents/about_us/our_vision_and_commitment/resilience/microgrid_services_tariff/20191121_microgrid_services_tariff_working_groups_final.pdf
[28] https://www.energy.gov/sites/prod/files/2016/06/f32/The%20US%20Department%20of%20Energy%27s%20Microgrid%20Initiative.pdf
[29] https://www.districtenergy.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=7a3060e7-a3f2-3d57-6f5f-2dd1cd35ce10&forceDialog=0
[30] https://www.rvcny.gov/electric-department/pages/pseg-transmission-rvc-substation-upgrade
[31] https://www.liherald.com/stories/rockville-centres-microgrid-plan-moving-forward,101180?

The complexity, cost, and relative novelty of multi-user microgrids has led utility-private ventures to become the most common and effective means of creating community microgrids. Utility-private multi-user microgrids support local community resiliency needs by interconnecting different private and utility-owned generation assets, allow private enterprises to mitigate impacts to their productivity and bottom-line, and meet state requirements for reliability, resiliency, and even renewable portfolio standards. Additionally, community multi-user microgrids inherently involve many contributors including the state public utility commission, local communities, utilities, private developers, and microgrid research institutions. Utility-private partnerships also promote enhanced utilization of financial and institutional leverages that both entities can bring to the microgrid project.

Utility-private ventures can reduce the per-participant cost and more effectively use local assets, especially through "bring-your-own-device" programs. Evermore in New Hampshire utilizes customer-owned batteries to shave peak demand and avoided spending $6 million on a 10-mile distributed circuit to help meet the peak demand. The "bring-your-own-device" was part of Eversource's microgrid project for the town of Westmoreland, New Hampshire[32]. The customers were able to earn up $1,000 a year for their behind-the-meter generation and storage assets, thereby reducing their own pay-back periods, while helping reduce the cost of electricity for Eversource. Another benefit of utility-private partnerships is the ability to work with other microgrids across the utility network. The Bronzeville microgrid was designed to connect to the Illinois Institute of Technology's electrically adjacent microgrid, thus allowing the two microgrids to share resources and provide a more robust and widespread resiliency capacity during power outages[33]. Utilities, as the distribution system operator, remain in a unique position to coordinate the resiliency efforts of individuals within and across communities and continue to add value to utility-private partnerships.

*"Bring-your-own-device" community microgrid programs are becoming increasingly popular as more customers adopt their own private generation and storage assets*

Additionally, Xcel Energy in Colorado has taken this utility-private approach when it applied for the Colorado Public Utilities Commission's approval of $23.4 million for seven community microgrids[34]. The seven communities will develop their own solar and back-up generation, and in some cases connect existing generation assets to the Xcel microgrids, while Xcel will provide 6MW of energy storage for the community microgrids. In part, Xcel's flexibility to pursue these microgrids occurs through Colorado's Energy Storage Procurement Act, passed in 2018, that allows investor-owned electric utilities to build up to 15 MW capacity[35]. Battery storage is a common utility-side investment for utility-private microgrid ventures. Like Xcel Energy, the NCEMC invests in battery storage to support the private-generation

[32] https://microgridknowledge.com/energy-storage-microgrid-eversource/
[33] https://www.utilitydive.com/news/coneds-hybrid-service-model-for-large-microgrid-could-become-standard/517413/
[34] https://microgridknowledge.com/xcel-energy-microgrids-siemens/
[35] https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/xcel-seeks-approval-for-microgrid-projects-in-colorado-58812685

assets and local grid conditions with its community microgrids; the NCEMC owns and operates the 500 kW Tesla battery bank for the Ocracoke Island Microgrid, the 2 MW BESS system for the Rose Acre Farms microgrid, and the 500 kW Tesla PowerPack battery system for the residential Eagle Chase microgrid[36].

The Redwood Coast Airport Microgrid is another utility-private multi-user microgrids that highlights the trends in resiliency, the future of renewable energy based microgrids, local legislative programs, and the economic benefits of implementing microgrids. The 2.25 MW solar array and battery energy storage system is set on land surrounding the Humboldt County Airport (ACV) and owned by the local Redwood Coast Energy Authority, a governmental Join Powers Agency[37]. The Schatz Energy Research Center (SERC) is the prime contractor for the project design and technology integration, the Redwood Coast Energy Authority will own and operate the generating resources, and PG&E will operate the microgrid circuit. The project was partially funded by a $5 million grant from the CPUC's EPIC program with the remaining $6 million funded by the Redwood Coast Energy Authority. The microgrid will offset 250 kW of daily usage by the airport, feed 2 MW of power into PG&E's grid, have 2 MW backup energy storage to support both the airport and the adjacent Coast Guard facility, and provide electric vehicle charging stations for airport customers and to respond to demand response events. The future of multi-user microgrids will largely model the Redwood Coast Airport Microgrid by integrating renewable distributed resources, building in added value services like electric vehicle charging, utilizing local utilities as monitoring and operating managers, and using a variety of financial resources to build the microgrid.

Inherently multi-user microgrids affect a variety of participants and are most effective when utility, private, and governmental entities are partners from the initial proposal stages. Shared financing, proven community resiliency and reliability needs, and technical leveraging are all commonalities among the established utility-private partnerships. In many cases, private partners share a significant cost and operational responsibility for the microgrid assets, while the utility partners continue to own and operate the distribution grid including the responsibility for service quality and safety. Utility-private partnerships also offer regulatory flexibility by maintaining partial ownership and control under the utilities to satisfy service mandates while also allowing for the financial flexibility given to private partners. To date, legislative and regulatory restrictions have constrained the flexibility of utilities and communities/developers to create innovative partnerships.

## Conclusion

Microgrids will continue to grow in popularity throughout large cities and small communities alike to address local resilience and sustainability objectives. Electricity is the lifeblood of a modern economy and the impacts of power outages have demonstrated the societal value of community microgrids. The utility-private model is at the forefront of multi-user microgrid development and is anticipated to continue as the main ownership model, due in large part to the economic and technical benefits of the

[36] https://www.ncelectriccooperatives.com/energy-innovation/microgrids/

[37] https://redwoodenergy.org/community-choice-energy/about-community-choice/power-sources/airport-solar-microgrid/

model. State legislative decisions and subsequent regulation will heavily impact future multi-user microgrid operational and ownership models depending on how each state views microgrid regulatory jurisdiction and the role of utilities in community multi-user microgrid development.

## Key Considerations

- Regulatory oversight should be considered for the safety and service quality performance of privately-operated community microgrids
- Regulatory oversight of non-utility provided resilience services and pricing to consumers should be considered to avoid price gouging
- Effective microgrid service tariffs, including costs and compensation need to be implemented equitably between utilities, microgrid operators, and private generation owners
- Enable greater flexibility for utility ownership-operational opportunities to foster community microgrid development
- Consider community-based microgrid funding mechanisms to address the societal value of resilience from a microgrid project

Greater regulatory flexibility for utilities, communities, and private developers to pursue various ownership and operational models will allow innovation to determine the best approach to community microgrids. At such an early stage in the development of multi-user community microgrids, an environment that fosters innovation to address increasing climate threats would serve all customers and communities interests.