

Barriers and Opportunities for Distributed Energy Resources in Minnesota's Municipal Utilities and Electric Cooperatives

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Minnesota has a complex electricity system, with more than 170 electric utilities, the third highest total of any state in the country. Minnesota has taken numerous steps in the past decade to become more efficient and better able to incorporate more renewable resources. While investor-owned utilities have received significant policy attention, the vast majority of the state's land-area and over one-third of the state's electricity is delivered by nonprofit locally controlled utilities: **municipal utilities** (munis) and **rural electric cooperatives** (co-ops).

Our team conducted a two-year research project to investigate the landscape of Minnesota's munis and co-ops. Our focus is on how these utilities are confronting new challenges and opportunities emerging from smaller-scale, often-more sustainable **distributed energy resources** (DERs), such as rooftop solar, community shared solar, LED light bulbs, controllable water heaters, and electric vehicles.

Munis and co-ops were built to serve their communities through participatory governance and local authority. They make decisions in fundamentally different ways than for-profit utilities. Generally, munis and co-ops are smaller utilities, but as power generation was increasingly deployed by larger centralized fossil fuel power plants decades ago, munis and co-ops had to work together to benefit from economies of scale. This led to a number of decisions that reduced costs for customers/members while ensuring reliability—for example by creating joint action agencies (JAAs) and generation and transmission cooperatives (G&Ts) that collectively invest and procure large amounts

of generation (see figures below). However, these same decisions, optimized for lowering cost and improving reliability in a different technological era, have left a legacy of institutional and contractual relationships that are constraining some opportunities today.

In the past decade, as DERs have become more economic, munis and co-ops have approached DERs in different ways than investor owned utilities. Across munis and co-ops, there is a wide diversity of responses to DERs. The large variation across Minnesota's 125 munis and 45 co-ops is driven by where they are located, whether or not their load and revenues are increasing or decreasing, from which organizations—and under what contractual restrictions—they purchase power, the degree to which they have already invested in DERs, their internal staff capacity and resources, and local demand for cleaner forms of energy, among other factors.

A key theme of our research is that the diversity of muni and co-op decision-making approaches for DERs can be helpfully characterized by four "**implementation strategies**," summarized in Table 1. The implementation strategies framework provides a taxonomy for understanding the approaches munis and co-ops are deploying to manage the opportunities and challenges of DERs. Recognizing differences in implementation strategies suggests the need for a diversity of engagement strategies to facilitate learning across utilities, building on the muni and co-op tradition of cooperation that bridges, but acknowledges, differences in individual local contexts.

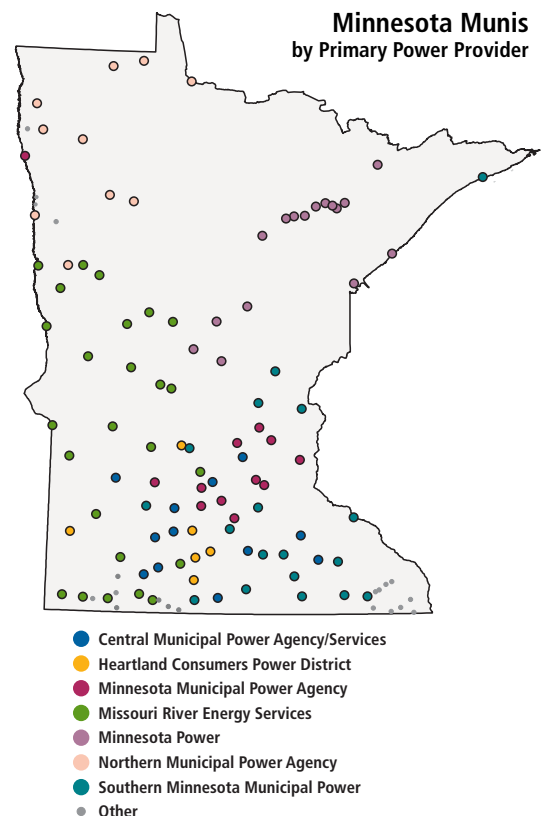
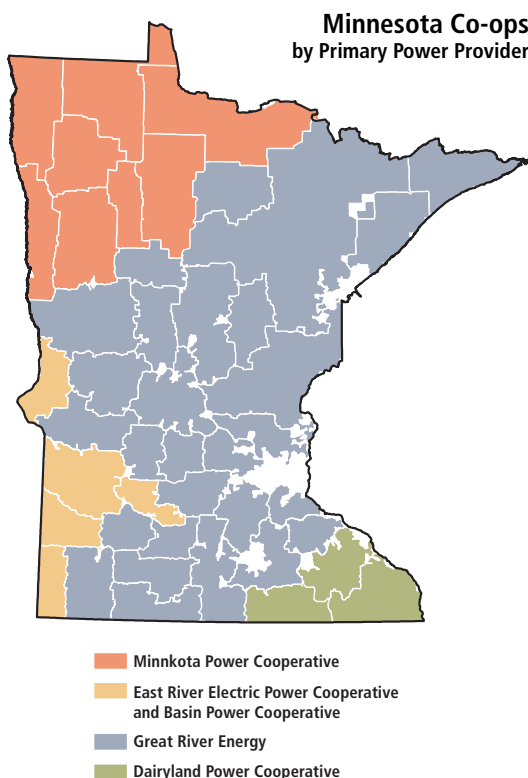


TABLE 1. **Four Implementation Strategies for Managing DERs**

<p>Monitoring and Planning</p> <p>An implementation strategy focused on monitoring changes in the industry, planning for the integration of DERs, and making strategic infrastructure investments in anticipation of future deployment. For example, several munis and co-ops explain their approach to DERs by discussing how higher levels of DER would require them to first upgrade their billing technology. Others emphasized the importance of deploying an outage management system, completing advanced metering infrastructure investments, or distribution system upgrades before taking on higher levels of distributed generation.</p>	<p>Reinforcing Traditional Relationships</p> <p>An implementation strategy characterized by the view that generation is primarily the responsibility of the energy-service providers (i.e., either a JAA or G&T co-op). When developing new programs, these utilities may partner with their energy-service provider and rely on their more extensive administrative capacity and resources. Many of these munis and co-ops discuss their obligation to educate and protect customers/members in making decisions about distributed generation investments, safety considerations, the importance of maintaining reliability, and the distribution-utility business model.</p>
<p>Community Engagement and Learning</p> <p>An implementation strategy focused on efforts to engage customers/members in outreach around DERs and new programs. For example, these munis and co-ops describe how individuals, civil-society stakeholders, or local political actors have a commitment to clean energy. Others discuss the importance of attracting businesses and clean energy jobs, while some emphasize that their customers/members are motivated primarily by the tax benefits and net-metering reimbursements that are associated with customer-sited solar.</p>	<p>Redefining the Distribution Utility</p> <p>An implementation strategy in which the distribution utility is leading new initiatives and taking more control over energy services. These utilities have customers/members that are interested in a 'cleaner grid,' and they are implementing solar offerings with a variety of different ownership and reimbursement schemes. These munis and co-ops are either skeptical of solar projects installed by their energy-service providers or seek flexibility in their energy-service contracts. Some of these munis and co-ops are also pursuing new forms of demand management.</p>

A second key theme of our research is that munis and co-ops hold a unique position to be important agents in **creating more sustainable, fair, and empowered local communities** through their engagement with DERs. This potential is being shaped by multiple factors; we highlight three: (1) the potential re-structuring of the relationships between distribution utilities and their generation and transmission providers, (2) engagement of distribution utilities with local policy goals through participatory governance, and (3) addressing fairness across customers/members and across distribution utilities.

Munis and co-ops rely on a complex set of relationships to deliver services: energy service providers, other distribution utilities, consultants, nonprofits, and local and state agencies all have a role. DERs are disrupting these institutional relationships and the rules and practices that munis and co-ops have relied on for decades. DERs expand the “solution space” for munis and co-ops to create community benefit. But DERs also create a need for policy, cooperation, and assistance.

Policy and engagement efforts with munis and co-ops should target the appropriate scale for intervention, compliance, and participation—from the state-level, to the utility level, to the customer/member or community level. The takeaways of our report follow five themes listed below and inform example policy and decision-making options for actors at different scales listed in Table 2.

- (1) Learning across utilities, experimentation, and more effective collaboration
- (2) Adapting or re-structuring power supply contracts
- (3) Information sharing, transparent decision making, structures for representation, and modes of participation
- (4) Fairness implications of policy design
- (5) Financing mechanisms, risk reduction, and joint ownership opportunities

For more, read our full report, available at chan-lab.umn.edu/municoop.

TABLE 2. **Example Policy and Decision-Making Takeaways**

	What State-Level Actors Can Do	What the Utilities Can Do	What Customers/Members or Communities Can Do
<p>Learning across utilities, experimentation, and more effective collaboration</p>	<p>Provide financial and institutional support for learning exchanges across utilities (e.g. seed grants, conferences, workshops, and formal organizations that engage all munis and co-ops).</p>	<p>Strengthen networks for knowledge exchange; organize workshops on emerging issues; develop best practices and share case studies.</p> <p>Engage those utilities without strong existing networks utilizing expert facilitators.</p> <p>Consider joint technology and program demonstration.</p>	<p>Organize customers/members, utilities, contractors, and other actors within the energy community for information sharing around best distributed energy practices.</p>
<p>Adapting or re-structuring power supply contracts</p>	<p>Develop guidance for contract re-negotiation and design that accommodates new technologies.</p> <p>Consider transparency requirements for power supply contracts, energy mixes, and resource planning.</p>	<p>Develop methodologies for assessing alternatives for power supply and other energy services.</p> <p>Provide support for studies of contract re-negotiation and design.</p>	<p>Request information from utilities over the contract design and sources of their power.</p>
<p>Information sharing, transparent decision making, structures for representation, and modes of participation</p>	<p>Consider transparency requirements for utility meetings and minutes.</p>	<p>Leverage technology and other modes of participation to enable democratic customer/member input in decision making.</p> <p>Develop best practices for communication and information technology.</p>	<p>Organize communities to hold local utilities accountable to local priorities.</p> <p>Engage utilities through existing channels and seek to create new channels.</p>
<p>Fairness implications of policy design</p>	<p>Modify existing and future policies to avoid one-size-fits-all policy design and accommodate local context.</p> <p>Allow for experimentation in DER reimbursement.</p>	<p>Support studies of the value of DERs that recognize regional differences or that are specific to utilities.</p> <p>Facilitate experimentation with DER reimbursement to balance multiple objectives, at a local and system level.</p>	
<p>Financing mechanisms, risk reduction, and joint ownership opportunities</p>	<p>Provide enabling conditions for finance targeted to munis and co-ops (e.g. tax credits or grants for DERs, and loan loss reserves or other credit enhancements).</p>	<p>Support and develop risk management and risk sharing opportunities.</p> <p>Enable new financing mechanisms.</p>	