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Voices from Rural Electric Cooperatives - A Call for a DER Integration Runbook

March 2025

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Changing the World's Energy Future

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Voices from Rural Electric Cooperatives: A Call for a DER Integration Playbook
for Rural and Agricultural Income & Savings from Renewable Energy (RAISE)

March 2025

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1 EXECUTIVE SUMMARY

Rural-serving electric utilities (RSEUs)—including electric cooperatives, municipal systems, and small investor-owned utilities—are essential players in the evolving energy landscape. These community-focused entities are increasingly being asked to consider distributed energy resources (DERs) such as rooftop and ground-mounted solar, wind, battery storage, smart water heaters, and demand response programs (NRECA 2025; Lenhart et al. 2020). Yet the path to DER adoption is far from straightforward in the rural context.

This report is based on in-depth interviews with nine managers of rural electric cooperatives across the United States. These conversations offer a grounded, unvarnished look at how DERs are perceived, what barriers exist, and what conditions might enable thoughtful integration. While the utilities interviewed vary in geography, size, and DER experience, several clear themes emerged:

- **All-requirements contracts with G&T providers** are a significant constraint, often prohibiting utility-owned DERs and complicating even small-scale innovation (Larson and Eicher 2001; Chan et al. 2024)
- **Financial concerns and risk aversion** dominate local decision-making, especially among boards that prioritize rate stability and predictability (Abhyankar and et al. 2023; Grimley 2019).
- **Limited system visibility and operational capacity** make it difficult to evaluate or integrate DERs in many rural networks (Casillas and et al. 2024).
- **Legacy load management programs** offer a cultural and technical foundation for future DERs, but often require modernization (Grimley 2019)
- **Skepticism about renewables** persists, especially where past experiences or outside vendors have eroded trust (Chan et al. 2024; RAP 2022).
- **Rate equity and member communication** are essential considerations—co-ops are deeply focused on fairness and transparency (Chan et al. 2024; Larson and Eicher 2001).
- **There is strong interest in low-risk experimentation**, peer learning, and support frameworks—not mandates or one-size-fits-all programs (Casillas and et al. 2024; Grimley 2019).

In response to these findings, the report recommends the development of a **DER Integration Playbook** specifically designed for RSEUs. This playbook would not dictate outcomes but instead offer a structured, flexible process for exploring DERs. It would help utilities:

- Assess readiness,
- Define local use cases,
- Engage stakeholders,
- Evaluate options,
- Pilot projects,

- Integrate successful approaches, and
- Iterate and expand over time.

This recommendation is grounded in cooperative leaders' real-world concerns—particularly around contractual constraints and limited administrative capacity. These themes are discussed in greater depth throughout the report.

The goal is not to accelerate DER adoption at any cost—but to empower rural utilities to make informed, member-driven decisions. With the right tools and support, RSEUs can chart DER pathways that reinforce their values, strengthen their systems, and serve their communities for decades to come.

2 INTRODUCTION

This report was developed with support from the **Rural and Agricultural Income & Savings from Renewable Energy (RAISE) Initiative**—a joint effort by the U.S. Department of Energy and the U.S. Department of Agriculture to help farmers, rural businesses, and communities benefit from renewable energy. The RAISE initiative focuses especially on underutilized technologies, including distributed wind, and aims to support practical pathways for rural-serving electric utilities to expand access to clean energy while maintaining affordability and reliability.

Distributed energy resources (DERs)—including wind, solar (rooftop and ground-mounted), battery storage, load control systems, and other distributed technologies—are increasingly recognized as tools to support reliability, resilience, and cost management at the distribution level (NRECA, n.d.; Lenhart et al. 2020; Larson and Eicher 2001). In this report, DERs are defined not by size or technology, but by their **interconnection point and relationship to the load they serve**. A DER is a resource—whether generation, storage, or demand-side—that is primarily designed to serve electric load on the same distribution network to which it is interconnected (Larson and Eicher 2001; Chan et al. 2024).

While much of the national conversation has focused on DER integration in investor-owned utilities and urban markets, rural-serving electric utilities (RSEUs) face a distinct and often more complex set of circumstances. These utilities operate under different regulatory regimes, serve sparsely populated territories, and answer directly to member-owners or local governments (NRECA 2025; Lenhart et al. 2020).

To better understand how DERs are viewed and managed by RSEUs, the research team conducted in-depth interviews with nine rural electric cooperative managers from across the United States. The interviews were semi-structured and covered a range of topics including financial considerations, operational capacity, member engagement, rate design, and governance. Interviewees were assured anonymity to encourage candor. These conversations were supplemented with prior reports and national guidance documents.

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The findings from these interviews are both sobering and hopeful. They reveal real barriers to DER adoption—particularly around contract constraints, financial risk, and system visibility—but also genuine interest in exploring DERs where they align with cooperative values and member needs. Importantly, many co-op leaders indicated a desire for better tools, clearer pathways, and opportunities to learn from peer experiences.

Note on Attributed Statements:
Throughout this report, statements attributed to cooperative managers appear in italics. **Italicized statements are close paraphrases** edited for tone, clarity, and brevity. All statements have been anonymized and reflect common themes across the interview set.

3 THEMES

This report summarizes the key themes that emerged from the interviews, offers a synthesis of their implications, and recommends the development of a DER Integration Playbook tailored to the needs of RSEUs. While the playbook is not the focus of this report, it is presented as a direct response to what managers said they need: a structured, flexible, and collaborative approach to exploring DERs at their own pace, on their own terms.

3.1 Theme 1: Contractual Constraints and G&T Relationships

One of the most consistent and strongly expressed themes from interviews with rural electric cooperative managers was the constraint imposed by all-requirements contracts (ARCs) with generation and transmission (G&T) providers. Nearly all the distribution cooperatives interviewed operate under long-term agreements—often lasting 40 to 50 years—that obligate them to purchase most or all of their energy needs from a single G&T cooperative. While these contracts were originally designed to provide stability and predictability, many managers now view them as a structural barrier to innovation .

Distribution managers repeatedly emphasized that ARCs limit their flexibility to own or operate distributed energy resources (DERs), particularly those located in front of the meter. *We can't pursue even modest cooperative-owned solar projects without getting approval from our G&T. And in many cases, that approval doesn't come.*

That said, managers noted that these contracts do not generally prohibit behind-the-meter DERs owned by members. However, the financial implications of these DERs are not straightforward. Most distribution cooperatives are billed for power supply by their G&T based on demand charges, but they often recover those costs from members primarily through energy (per kWh) charges and modest fixed monthly fees. This mismatch means that when a member installs a DER system and reduces their energy consumption, the cooperative's infrastructure costs may remain unchanged while its ability to recover those costs is diminished. *We only have a few meters per mile, and our fixed monthly charges don't recover the cost to maintain that infrastructure.*

This challenge is compounded by the use of demand ratchets in some wholesale contracts, which lock in capacity charges based on the highest monthly or annual peak, even if demand later declines due to DER deployment. This reduces the perceived value of DERs to the co-op and makes financial modeling more difficult. *Even if the DER makes sense on paper, we often don't see meaningful cost savings for a year or more—if at all, due to the way our demand charges are structured.*

Interviewees emphasized that even terminology matters. While both "peak shaving" and "load factor management" refer to shaping demand profiles, the former can trigger contractual scrutiny under all-requirements agreements. Several co-ops described shifting their language—and strategies—to emphasize distributed, member-driven contributions to system efficiency. This linguistic precision helps avoid legal pitfalls while still managing demand.

One cooperative shared how they encouraged a third-party to develop solar assets within their service territory, knowing they could not directly own or dispatch the project due to contract terms. While this approach tested the limits of the all-requirements contract and even prompted legal review, it ultimately allowed the utility to increase renewable supply without direct ownership or contractual breach.

Several managers expressed frustration that their G&T providers were not responsive to local needs or interests. *It often feels like a one-way street, where the G&T determines what's allowed and we have little room to negotiate or shape a DER strategy.* Others, however, emphasized that collaboration was possible. In particular, some pointed to successful efforts to negotiate DER pilot programs or community solar carve-outs with their G&T, especially where trust and communication had been built over time .

Even among co-ops that were generally satisfied with their G&T relationship, there was a consistent desire for greater contractual flexibility—particularly in light of federal incentives, changing member expectations, and opportunities for resilience. *We're not trying to go rogue. We just want to be able to try things that make sense for our members.*

These insights suggest that the structure of wholesale power contracts is among the most critical factors shaping whether and how DERs can be integrated into rural distribution systems. As such, any future guidance or playbook for DER adoption by rural-serving utilities must directly address the role of ARCs and offer pathways for negotiation, exemption, or innovation within those agreements

3.2 Theme 2: Financial and Risk Considerations

Concerns about cost, uncertainty, and financial risk permeated nearly every conversation with cooperative managers. While the potential benefits of distributed energy resources (DERs) were broadly acknowledged, most interviewees framed DER development as financially risky—particularly for small or resource-constrained co-ops (Abhyankar and et al. 2023; Chan et al. 2024).

One recurring theme was a lack of capacity to plan, finance, or administer DER programs. *It's not that we don't want to do something innovative. We just don't have a full-time grant writer or analyst to figure it all out.* Even where federal incentives exist, such as USDA REAP grants or direct-pay tax credits, the administrative burden of applying and managing these programs is often too high for existing staff (Ackenhusen et al. 2024; Grimley 2019).

The burden of accessing federal grant programs like USDA REAP was a recurring theme in discussions. In one recent example shared by the project team, a small business submitted a 300-page application for a $10,000 USDA REAP grant—underscoring how administrative demands can outweigh the value of the award. While this case did not come directly from the interviewed cooperative managers, it illustrates a concern many echoed: even with generous federal incentives, the time and expertise required to apply can be a prohibitive barrier. Any future guidance or Playbook should include tools to streamline this process—such as templates, checklists, and annotated examples.

Risk aversion also played a central role. Several managers described their boards as fiscally conservative and skeptical of technologies that have not demonstrated clear, short-term returns. *If the benefit isn't obvious and immediate, it's a tough sell.* This finding is consistent with previous

studies on rural utility governance, which highlight how risk tolerance is shaped by member expectations and board accountability (Lenhart et al. 2020).

This mindset extends to infrastructure investment as well. One cooperative passed on an opportunity to install a community-scale battery because *no one on the board wanted to be the one who said yes to a million-dollar science project.* In another case, a co-op had to turn away from a promising solar partnership because the internal rate of return didn't meet the board's minimum threshold—even after factoring in federal incentives.

Despite these concerns, some small cooperatives have demonstrated that DERs can provide meaningful long-term financial benefits when carefully planned. One rural cooperative of fewer than 1,000 members recently constructed a nearly 1,000-kilowatt solar array, funded in part by a USDA REAP grant. The project, which cost approximately $1.5 million, is expected to lower power supply costs and help the cooperative maintain affordable rates. As the manager noted, the decision was economic at its core: *If it didn't pay for itself, we wouldn't do it.* By investing in local generation, the co-op keeps more energy dollars circulating within the community rather than sending them out of state—a value proposition that resonated with both the board and members.

Several cooperatives also raised concerns about rate design and fairness. While DERs can help lower some members' bills, there is anxiety about cross-subsidization. *We have to keep rates fair for everyone. I'm not going to create a program that shifts costs onto our elderly members on fixed incomes*.

The combination of low appetite for financial risk, limited internal capacity, and concern for member equity creates a challenging environment for DER adoption. Yet even the most cautious managers expressed interest in exploring DERs—if they could be assured of predictable costs, limited downside, and clear community benefit. Some suggested that pilot programs or regional demonstration projects, particularly those with external technical assistance or funding, could help bridge the gap (Casillas and et al. 2024; RAP 2022).

Ultimately, what emerged was a strong demand not for mandates or aggressive targets, but for flexible, well-supported financial models that allow cooperatives to test and scale DERs at their own pace. *If we had a simple model that showed how to make it pencil—and someone to help us run it—we'd be willing to give it a shot.*

3.3 Theme 3: Operational and Technical Integration Challenges

Even for cooperatives that are open to distributed energy resources (DERs) in principle, practical questions about integration loom large. Many interviewees described their systems as technically fragile, minimally instrumented, and aging—hardly an ideal foundation for dynamic, bidirectional power flows (Grimley 2019; National Academies of Sciences 2025).

One of the most vivid examples of these concerns came during Winter Storm Uri in February 2021. AECI, which had 1,240 MW of wind under contract, saw near-zero output from its wind fleet due to blade icing and turbine shutdowns during peak demand conditions. Despite an all-time winter peak of 5,549 MW, AECI was able to maintain service using its coal, gas, and hydro resources, while its wind generation contributed only marginally ("Tudor Testimony 6-1-23 SENR Cmte Hrg," n.d.; National Academies of Sciences 2025). Managers referenced this event as a cautionary tale that shapes how they evaluate both DER reliability and grid planning priorities under extreme weather stress.

Events like Winter Storm Uri highlight the challenge of treating renewables as firm resources. When wind generation failed due to icing, utilities had to rely on dispatchable assets to maintain service. This underscores the importance of pairing renewables with battery storage or other firming strategies to enhance reliability. Playbook guidance should reflect this by helping co-ops evaluate when and how to invest in firming technologies.

Several co-ops noted that their distribution networks lack the visibility necessary to plan for or operate with significant DER penetration. *We don't have feeder-level monitoring. We don't know where the peaks are happening, or even how much solar is on the system.* Others pointed out that even if they wanted to conduct a hosting capacity analysis or forecast the impact of DERs, they lacked both the internal expertise and the tools to do so.

Smart meters were installed in many service territories, but managers often described them as *data-rich and insight-poor.* While AMI data could, in theory, inform better planning or support rate design, most cooperatives lack the analytics infrastructure or staff to use this data effectively. *We have gigabytes of data coming in, but no one to turn it into anything actionable.*

Inverter-based resources also raised concerns. Some managers expressed uncertainty about settings, protection schemes, and the risk of unintentional islanding. *We're not in a position to take on new operational risk. If it trips a breaker on the wrong feeder, we might not even know until someone calls in.* These concerns reflect a broader need for improved visibility and control of DERs, especially in non-urban systems (National Academies of Sciences 2025).

Several managers stressed the lack of technical staff and training as a major barrier to DER integration. Even when DERs are present, anomalous readings or inverter failures can leave co-ops scrambling for support. These challenges mirror those faced by larger investor-owned utilities, suggesting a systemic need for better troubleshooting protocols and tools—areas that a DER Playbook could address.

This lack of control visibility is especially concerning in systems where long rural lines, minimal redundancy, and older substations already create reliability challenges. Managers reported feeling vulnerable to disruptions—whether from weather, wildlife, or DER variability—and emphasized that their operational teams were already stretched thin.

A few interviewees expressed interest in emerging technologies, such as DER management systems (DERMS), Volt/VAR optimization tools, or SCADA expansion, but said those systems felt out of reach. *We're still trying to get SCADA fully deployed. The idea of coordinating batteries and inverters across the network is… aspirational*.

Despite these challenges, there was widespread openness to learning. Some cooperatives had worked with national labs or consultants to run preliminary system impact studies or load forecasts, and found these experiences valuable. Others expressed hope that a regional or statewide support network could help bridge the gap—either by providing technical assistance or developing standard playbooks.

Ultimately, technical constraints were not seen as insurmountable, but they were understood to be real. Managers stressed that any DER planning process must start from an honest assessment of grid capabilities, staff training, and existing data systems. *We're not against new technology. But we need to walk before we run.*

3.4 Theme 4: Legacy Load Management Programs as a DER Foundation

Several interviewees emphasized that distributed energy resource (DER) integration was not a new concept for their systems—it was an evolution of something they had already been doing for decades. Load management programs, particularly those involving electric water heaters, dual fuel heating, and interruptible irrigation, were described as the "original DERs" by some cooperative managers.

Many cooperatives had long-standing programs that used radio signals, ripple control, or powerline carrier to cycle loads during peak periods. These legacy systems were not just technological assets; they were also deeply embedded in local cooperative culture. *We've been doing demand response since the '80s. We just didn't call it that.*

These programs have built significant operational trust between members and their utilities. For instance, one cooperative still operates a water heater control program that includes over half of its residential members. Another cited a dual-fuel heating program where members allowed the utility to curtail electric heat and switch to propane during peak demand events. In both cases, participation was high and member acceptance strong—due in large part to years of consistent, reliable operation and straightforward communication.

Some managers noted that these programs are now underutilized or in need of modernization. Equipment is aging, and in some cases, parts are no longer available. Others said their systems were still fully functional, but they lacked the analytics or remote control capabilities that newer DER programs require. *We have a lot of potential sitting on the shelf. If we could connect our legacy load control to a smarter platform, we could do a lot more with what we already have"* (Casillas et al. 2024).

In addition to the hardware, managers emphasized the social infrastructure created by these programs. The cooperative model, with its emphasis on local governance and trust, has enabled these programs to persist where they might have faltered elsewhere. Managers saw this history as a critical asset in expanding into new DER programs. *Our members are used to the idea that we help manage energy. That makes conversations about batteries or solar a lot easier.*

The legacy of load management offers a practical and cultural foundation for DER adoption. As rural cooperatives consider how to modernize their grids and engage members in new programs, these existing assets—both technical and relational—can serve as a springboard. Future guidance or playbooks should include pathways for upgrading or expanding legacy programs, particularly where they already enjoy high levels of trust and participation.

By modernizing legacy programs—e.g., connecting water heaters to smart controllers—cooperatives can expand DER functionality without starting from scratch. These programs also offer a social foundation for DER expansion, building on years of member trust and operational familiarity.

3.5 Theme 5: Perceptions of Renewables and Trust in DERs

Across the interviews, it became clear that perceptions of renewable energy—especially solar and wind—were shaped as much by personal and institutional history as by technical or economic analysis. Several cooperative managers expressed skepticism about the reliability of renewables, often referencing high-profile events like Winter Storm Uri as evidence that intermittent resources cannot be depended on during critical periods (NAS 2025; Abhyankar et al. 2023).

Managers repeatedly referenced Winter Storm Uri as a pivotal moment in shaping skepticism toward renewables. In particular, they pointed to the sharp contrast between projected and actual wind generation during the event. *We were told wind would help us get through. But when it mattered, it didn't show up.* This sentiment was especially pointed in Missouri and the Midwest, where blade icing and freezing fog rendered much of the region's wind fleet inoperative during critical periods.

There's a lot of marketing around solar and wind. But when the power goes out, our members don't want a brochure. They want their lights on. For some, this experience had solidified the belief that renewables are not firm resources and should not be treated as such in planning processes.

However, several managers acknowledged that these reliability issues are not inherent to renewables themselves but to their lack of dispatchability. With appropriate firming resources, such as battery storage or hybrid systems, DERs can become more dependable assets. Future guidance or playbooks should frame DERs within integrated strategies—highlighting how storage can mitigate variability and increase operational confidence.

That said, these views were not universally hostile to renewables. Many managers made a careful distinction between the concept of renewables and the business models or technologies used to deploy them. The issue, in their view, was not with wind or solar per se, but with how they were being packaged and promoted—often by third-party vendors who were perceived as prioritizing sales over long-term performance or transparency.

Several interviewees shared concerns about "solar scams" or misleading claims made by out-of-state installers. One manager described having to intervene when elderly members were pressured into signing contracts they didn't understand. *We're still the most trusted local institution. When something goes wrong, they call us—not the solar company*.

This dynamic places cooperatives in a delicate position: they remain the most trusted institution in their communities but may have limited control over DER installations initiated by third parties. Several interviewees emphasized the importance of providing accurate, unbiased information to members and ensuring DER-related expectations are realistic and clearly communicated.

This sense of responsibility contributed to a cautious stance on DER promotion. Managers emphasized that they could not endorse technologies they didn't fully trust or understand, especially if the financial or operational risks would ultimately be borne by the cooperative and its members. *If it breaks, it's our name on the truck.*

However, this caution was not immutable. A few co-ops had found ways to build trust in DERs through transparent pilot programs, strong vendor partnerships, and incremental scaling. One cooperative launched a small community solar program specifically to "de-risk" the technology for members and the board. Another developed internal criteria for evaluating DER proposals, including a requirement for clear O&M responsibilities and member-facing education materials.

These examples illustrate that trust can be built over time, especially when cooperatives maintain control over project design, vendor selection, and communication. One manager noted that by starting small, being transparent with members, and focusing on local benefit, they were able to "turn a skeptical board into a supportive one." The combination of community-scale pilots, clear financial rationale, and visible local benefits often tipped the scales.

These examples suggest that trust is not simply a matter of technology—it's a function of governance, communication, and experience. Where co-ops felt they had control over the DER deployment process and confidence in the partners involved, they were far more likely to support renewable initiatives. Where those elements were missing, resistance tended to harden.

The perception of DERs as either risky or trustworthy appears to hinge on a few key factors: operational transparency, vendor accountability, clear financial models, and local control. For cooperatives considering future DER programs, building trust will require as much attention to these governance and relationship factors as to technical design. *If we're going to put our name on it, we have to believe in it.*

3.6 Theme 6: Member Engagement and Rate Equity

While not always discussed in isolation, member engagement and rate fairness emerged as persistent undercurrents throughout the interviews. Cooperative managers consistently framed their DER-related decisions in the context of community trust and perceived fairness. *At the end of the day, every one of our members is also a voter. And they all talk to each other.*

One of the most frequently cited concerns was the potential for cross-subsidization between DER and non-DER members. Several managers described scenarios in which members who could afford solar installations were able to dramatically reduce their bills, leaving those without DERs—often lower-income or elderly members—responsible for a greater share of fixed infrastructure costs. *We're not going to punish someone for putting solar on their roof. But we can't ignore the cost shift either.*

To address this issue, many cooperatives have implemented or are considering adjustments to rate structures, such as increasing fixed charges or introducing demand charges. However, these changes are not without trade-offs. Higher fixed charges can erode the economic value of DERs and disproportionately affect members with lower usage patterns, who are often the most financially vulnerable.

Beyond the rate structures themselves, managers emphasized the importance of transparency and communication. Several noted that DER-related billing confusion was a common source of member frustration, particularly when it came to how credits were calculated or why savings didn't match expectations. One co-op had launched a DER education series, including community forums and bill walkthrough sessions, to address misunderstandings and reduce tension.

Given how often billing misunderstandings cause tension, the Playbook should include communication templates and visualization tools that demystify how DERs affect rates, bills, and credits. Several co-ops expressed interest in member-facing dashboards that break down costs and savings in plain language.

Others spoke about the role of member advisory committees or board engagement in shaping DER policies. In one case, a cooperative's board was initially skeptical of net billing until staff brought in case studies from neighboring systems and walked through the rate impacts using real member data. *It's not about pushing DERs. It's about being honest with people about the costs and benefits.*

Several managers highlighted the unique governance structure of cooperatives as both a challenge and an opportunity. On one hand, direct member accountability makes it harder to push through unpopular rate changes. On the other, it allows DER policies to be tailored to local

values and priorities. *We're not beholden to shareholders. We're beholden to the folks at the grocery store*.

In short, DER adoption in rural electric cooperatives is deeply intertwined with questions of fairness, inclusion, and communication. Managers were acutely aware that even well-intentioned programs could create perceptions of inequity if not carefully designed and clearly explained. For DERs to succeed at scale, co-ops will need not only technical tools and financial models, but also durable strategies for member engagement, education, and governance alignment.

3.7 Theme 7: Innovation, Pilots, and the Desire for a Path Forward

Despite the structural, financial, and operational constraints voiced throughout the interviews, cooperative managers consistently expressed a desire to explore what's possible. While few were prepared to make large-scale investments in DERs, many were actively looking for manageable, low-risk entry points—especially those that could be tailored to local needs and paired with external support.

We're not anti-innovation. We're just trying to avoid becoming the beta test site for something we can't afford to fix. This sentiment encapsulates the cautious optimism that characterized many of the conversations. Co-ops weren't dismissing DERs; they were asking for a clear, credible, and cooperative way to begin engaging with them.

Several interviewees pointed to pilot programs—either implemented or desired—as essential tools for building internal confidence and demonstrating value to boards and members. One co-op had launched a pilot to test smart thermostats and was monitoring load impacts during winter peak periods. Another was experimenting with member-owned battery storage and evaluating whether the aggregated systems could provide value at the feeder level.

In each case, the emphasis was on learning—not on immediate scale. *Our goal isn't to change the grid overnight. It's to understand how this works in our context, with our members, and our infrastructure.*

Partnerships were frequently cited as enabling factors. Several cooperatives had collaborated with state energy offices, national labs, or university researchers to access technical expertise or modeling tools they couldn't support in-house. Others mentioned working with vendors on small-scale trials, though with caution about long-term commitments or vendor-driven agendas

There was strong interest in peer learning. Managers spoke positively about hearing what neighboring co-ops were doing and often used those examples to make the case for local exploration. *If someone down the road can show it works, it makes it a lot easier to pitch here.* Several interviewees suggested that a centralized clearinghouse of vetted DER pilots—with performance data and lessons learned—would be a valuable resource.

When asked what kind of support would be most helpful, managers pointed to decision-support tools, technical assistance, and templates for financial modeling and member communication. But what they emphasized most often was flexibility: the ability to explore DERs at their own pace, with tools that respected their contractual obligations, capacity constraints, and local priorities.

If there was a roadmap that helped us figure out what's possible—and how to do it without blowing up our contract or alienating the board—we'd use it. We just don't have time to start from scratch.

These interviews suggest that rural electric cooperatives are ready to engage with DERs—not through mandates, but through measured, member-aligned experimentation. What they need is not a prescription, but a process. A playbook, as several hinted, that could show them how to ask the right questions, pilot the right projects, and chart their own course forward.

4 SYNTHESIS AND IMPLICATIONS

The seven themes that emerged from interviews with rural electric cooperative managers paint a clear picture of a sector at a crossroads. On one hand, cooperatives face real and persistent barriers to DER adoption—contractual inflexibility, financial risk aversion, aging infrastructure, and operational constraints. On the other, they possess unique assets that position them well for thoughtful, member-centered innovation: longstanding trust, deep community roots, and a history of managing distributed resources through load control (Grimley 2019; Lenhart et al. 2020).

What stands out most from the interviews is not resistance to change, but a demand for *intentionality*. Cooperative leaders want to move forward with DERs, but only in ways that align with their obligations to members, their capacity to manage risk, and their mission of delivering affordable, reliable service. Across diverse geographies and G&T relationships, the message was consistent: co-ops need support in order to explore DERs—not just funding or mandates, but structured pathways that respect their context and constraints.

The implications of these findings are threefold:

1. **Structural barriers are real, and must be addressed head-on.** Many cooperatives operate under long-term power supply contracts that limit their ability to own or control local DERs. Without pathways for contract negotiation, carve-outs, or exemptions, even the most motivated co-op may be unable to act (Sarkisian and Cliburn 2021; Lenhart et al. 2020).
2. **DER adoption is as much about governance as it is about technology.** Concerns about fairness, transparency, and member trust are central to every DER conversation. Co-ops aren't just managing electrons—they're managing relationships. Programs that overlook these dynamics are unlikely to succeed. A viable path forward must combine technical and financial tools—such as pre-built models for interconnection, rate design, and DER analysis—with resources for stakeholder engagement, communication, and board education. Where possible, automation can help lighten the administrative and technical load, allowing small co-ops to focus on strategy and member service rather than system complexity.
3. **Co-ops are ready to explore—but need a low-risk, high-trust process.** What cooperative leaders want is not a blueprint, but a process: a structured way to assess readiness, define goals, evaluate options, and learn from peers. They are looking for ways to try small pilots, gather data, and scale what works—with clear guardrails and decision-making tools.

These insights provide the foundation for the next section of the report: a recommendation to develop a national DER Integration Playbook designed specifically for rural-serving electric utilities. Such a resource would translate the lessons of these interviews into actionable

guidance—empowering co-ops to move from interest to implementation, at their own pace and on their own terms.

5 RECOMMENDATION: DEVELOP A DER INTEGRATION PLAYBOOK FOR RURAL-SERVING UTILITIES

The interviews conducted for this report make one thing abundantly clear: rural electric cooperatives are not opposed to distributed energy resources (DERs). In fact, many are eager to explore how DERs might support their goals for reliability, affordability, resilience, and member engagement. But they need a path forward that is as thoughtful, flexible, and grounded as the communities they serve.

This report recommends the development of a **Distributed Energy Resource Integration Playbook** designed specifically for **rural-serving electric utilities (RSEUs)**—including electric cooperatives, municipal utilities, and small investor-owned systems. This playbook should provide a **step-by-step framework** that RSEUs can use to assess, pilot, and implement DERs in ways that align with their technical, contractual, financial, and community contexts.

Rather than prescribe a one-size-fits-all solution, the playbook would serve as a **decision-support resource**, offering templates, case studies, and tools to help utilities:

- Understand their contractual and regulatory constraints
- Define DER use cases that support utility and member goals
- Engage boards, members, and power suppliers in meaningful dialogue
- Evaluate DER options through financial and technical modeling
- Design and execute small-scale pilots
- Incorporate DERs into standard utility operations
- Monitor outcomes and iterate over time

5.1 DER Integration Playbook Framework

The proposed DER Integration Playbook is designed to help rural-serving electric utilities achieve measurable outcomes for their systems and communities. It supports load factor management, reliability, resilience, affordability, and member satisfaction by offering practical processes and tested tools tailored to small utility environments. It's a step-by-step framework that helps co-ops plan, pilot, and implement DER projects — all while working within their existing governance, staffing, and contractual structures.

5.1.1 Step 1: Assess Readiness

Evaluate internal capacity, governance flexibility, technical systems, and wholesale power contracts. Use toolkits like the NRECA Distributed Generation Toolkit (for interconnection standards), the ACCESS Solar Readiness Guide, and readiness checklists from the SPECs Early-Stage Decision Model. One interviewee described their co-op as "stuck" — with limited AMI data and no room to maneuver due to an inflexible contract. A readiness scoring framework that spans staffing, data, and policy would fill a critical gap here.

5.1.2 Step 2: Define Use Cases and Objectives

Rather than simply shaving peaks, utilities can use DERs to improve load factor management — distributing energy use more evenly over time to optimize infrastructure investments. Other use cases include resilience for critical loads, affordability for members, and member-driven investment opportunities. Tools like the DER Compensation Guide and SEPA's DER capabilities mapping help match DER types to co-op objectives. One manager said, "We're not chasing renewables — we're chasing member value and system efficiency."

5.1.3 Step 3: Engage Stakeholders

Stakeholder trust is essential. Successful co-ops have involved boards, member advisory committees, and G&Ts early in the DER process. Tools like the ACCESS Communications Toolkit and SEPA's Reimagining Resilience guide offer templates and sequencing for engagement. Interviews emphasized the importance of transparent messaging, especially on cost equity, and the use of real-world analogies (like "buying one panel" in a solar garden) to explain participation.

5.1.4 Step 4: Model and Evaluate Options

Before committing to a project, co-ops must understand the technical and financial implications of DER integration. Over the past several years, national labs, NRECA, and other energy-sector organizations have developed a range of tools to assist with project evaluation, rate design, and system modeling. However, many utilities are unaware of these resources or unsure which ones apply to their specific needs. The proposed Playbook can serve as a central catalog—helping co-ops identify the right tools for their use cases and offering guidance on how to apply them effectively. As one manager noted, "We don't have a modeler on staff." The Playbook can bridge that gap, offering practical starting points and pathways to technical assistance so that projects can "pencil out" without relying on special grants or incurring unsustainable debt.

5.1.5 Step 5: Pilot and Demonstrate

The playbook should highlight and suggest potential pilots to reduce risk and build internal momentum. The classic example is Farmers Electric Cooperative in Kalona, Iowa, which launched a solar garden in 2012 with just 20 panels — sold out in two days. Members could purchase one or more panels and receive bill credits, and the project expanded organically from 13.8 kW to 40 kW. "We planted the first solar garden and just kept growing it," one staff member said. This model helped normalize DER investment in a tight-knit rural community, making solar feel local and accessible.

5.1.6 Step 6: Operationalize

This step should prioritize protocols and process design, not expensive platforms. While tools like R3IT automate interconnection, and DERMS (Distributed Energy Resource Management Systems) provide system-level visibility, many co-ops can begin by updating:

- Outage restoration workflows (e.g., how to safely restore when batteries are on-site)
- SCADA alert protocols for new inverter profiles
- Member-service staff training on DER billing

One manager put it plainly: "We don't need to buy a control room; we need to modernize how we operate." The playbook should offer scalable operations templates for small co-ops.

5.1.7 Step 7: Monitor, Iterate, Expand

Successful DER programs are adaptive. Utilities should track performance using both financial benchmarks and reliability metrics to evaluate outcomes and guide future investment.

Financial benchmarks include:

- Monthly or seasonal peak demand charges from the G&T
- Energy sales trends, to track changes in retail revenue
- DER penetration at the feeder level, compared to infrastructure investment needs (e.g., reconductoring, transformer upgrades)

Tracking DER deployment alongside feeder-level infrastructure spending may reveal whether DERs reduce or delay system upgrades—a key opportunity area for utilities trying to manage capital investments.

Reliability metrics include:

- SAIDI (System Average Interruption Duration Index): the average total outage duration per customer per year
- SAIFI (System Average Interruption Frequency Index): the average number of outages each customer experiences per year

Together, these indicators can help utilities assess whether DERs are strengthening grid performance or simply shifting cost burdens. One manager emphasized the value of a shared dashboard that would let rural co-ops benchmark their DER-related outcomes against peers.

5.1.8 Expanding the Co-op Model: From Infrastructure to Innovation

This playbook should be developed collaboratively, drawing on the experiences and insights of rural-serving electric utilities themselves—alongside national labs, associations, and public-sector partners. Its structure must reflect not only policy objectives, but also the **member-first values of rural cooperatives:** voluntary participation, democratic governance, education, and local empowerment.

The most effective DER strategies will build on existing cooperative strengths—particularly those demonstrated in successful ventures like community energy programs, broadband expansion, and electric vehicle infrastructure. In recent years, many RECs have launched high-speed internet services by leveraging their poles, crews, and trusted local brand. They saw an opportunity to provide a valuable new service, support economic development, and generate long-term revenue. DER integration, for some, is following a similar path: not as a regulatory mandate, but as a natural evolution of the co-op model. It's another way to provide reliable, affordable electricity—now with added resilience, member choice, and new revenue streams. Like communications, DERs are not a departure from the co-op's mission. They're an expansion of it.

We don't need someone to tell us what to do. We need someone to help us figure out how to do what we already want to try.

6 CONCLUSION

The voices captured in this report reflect a sector that is both cautious and curious—grounded in tradition, yet attentive to the possibilities on the horizon. Rural electric cooperatives operate in complex environments shaped by long-term contracts, community trust, and the persistent challenge of delivering reliable, affordable power across vast geographies. While the promise of distributed energy resources (DERs) is real, so too are the barriers.

What emerged from these interviews was not a call for revolution, but for **practical evolution**. Cooperative managers want to explore DERs in ways that honor their obligations, reflect their members' priorities, and protect their financial sustainability. They seek a structure that allows for experimentation without undue risk, adaptation without disruption, and innovation without alienation.

These are not small asks—but they are achievable. What's needed now is a collaborative effort to build the tools, frameworks, and peer support systems that will help rural-serving electric utilities navigate this transition on their own terms. The development of a DER Integration Playbook, as recommended in this report, is a key enabler toward that goal.

The challenge isn't lack of interest—it's lack of clarity. A Playbook doesn't replace capacity, but it shortens the time between curiosity and confidence. By embedding legal nuance, technical pathways, and community guidance, it becomes more than a resource—it becomes a trusted tool for strategic planning.

Ultimately, the future of DERs in rural America will not be decided by mandates or markets alone. It will be shaped by the local conversations happening in co-op boardrooms, community halls, and member kitchens. This report is a reflection of those conversations—and a recognition that when cooperatives are supported to lead, they can chart a path that is both innovative and true to their mission.

We've done big things before. We just need the right tools, the right partners, and the space to do it our way.

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Appendix A. Interview Protocol Summary

This report is based on in-depth interviews with nine rural electric cooperative managers conducted between [November 2024 and March 2025]. The interviews were part of the Rural and Agricultural Income & Savings from Renewable Energy (RAISE) Initiative, funded by the U.S. Department of Energy and the U.S. Department of Agriculture. The goal of these interviews was to understand how rural-serving electric utilities are navigating the opportunities and challenges associated with distributed energy resources (DERs).

Interview Structure

The interviews were semi-structured, allowing for a consistent line of inquiry while also giving interviewees space to elaborate on areas of particular relevance to their utility. Topics included:

- DER definitions and attitudes
- Financial risk and cost recovery
- Contractual relationships with G&T providers
- Operational and technical readiness
- Member engagement and equity
- Rate design and demand charges
- Experience with pilots and innovation

Interview Process

- **Total interviews conducted:** 9
- **Interview length:** 45–75 minutes each
- **Format:** Virtual (Zoom or phone)
- **Geography:** Interviewees represented distribution cooperatives from the Midwest, Great Plains, and Southern U.S.
- **Confidentiality:** Participants were promised anonymity. Quotes included in this report are not attributed to individuals, co-ops, or specific states. Positions (e.g., General Manager, Engineering Lead) are generalized for confidentiality.

Use in Analysis

Interview transcripts were reviewed and coded using a thematic analysis process. Themes were not pre-imposed but developed inductively from the content of the interviews. Quotations were selected to illustrate the core themes and to reflect common concerns, innovations, or requests across interviewees.

This qualitative approach was chosen to surface grounded, experience-based insights that may not appear in formal policy reviews or quantitative data sets. The interviews informed all seven core themes of the report and serve as the foundation for the recommendation to develop a DER Integration Playbook tailored to the needs of rural-serving electric utilities.