Smart Electric Power Alliance

Microgrid Industry Update
RE+ Microgrids 2025

In partnership with EMerge Alliance, Microgrid Resources Coalition, and RE+ Events

OCTOBER 2025

Table of Contents

List of Figures

List of Tables

Copyright

© Smart Electric Power Alliance, 2025. All rights reserved. This material may not be published, reproduced, broadcast, rewritten, or redistributed without permission.

Authors

Jared Leader, Senior Director, Research & Industry Strategy, Smart Electric Power Alliance

Weston Dengler, Senior Analyst, Research & Industry Strategy, Smart Electric Power Alliance

Mac Keller, Manager, Research & Industry Strategy,
Smart Electric Power Alliance

About SEPA

The Smart Electric Power Alliance (SEPA), a 501(c)(3) organization with over 1,000 members, accelerates the transition to a clean, affordable, and resilient electricity system for all. SEPA engages with its diverse membership—which includes utilities, policymakers, regulators, and technology companies—through education, collaboration and convening, and the search for innovative policy, regulatory, and technology solutions. For more information, please visit www.sepapower.org.

Disclaimer

All content, including, without limitation, any documents provided on or linked to the SEPA website is provided "as is" and may contain errors or misprints. SEPA and the companies who contribute content to the website and to SEPA publications ("contributing companies") make no warranties, representations or conditions of any kind, express or implied, including, but not limited to any warranty of title or ownership, of merchantability, of fitness for a particular purpose or use, or against infringement, with respect to the content of this website or any SEPA publications. SEPA and the contributing companies make no representations, warranties, or guarantees, or conditions as to the quality, suitability, truth, or accuracy, or completeness of any materials contained on the website.

Acknowledgments

Thank you to the speakers, participants, and partner organizations who contributed to the RE+ Microgrids Policy Workshop. Their insights and shared experiences were central to the discussions and recommendations captured in this briefing. We also thank RE+ Events for their partnership and support in making this workshop possible.

Featured Speakers included Jeff Morris, Schneider Electric North America; Charles Fox, Bloom Energy; Cameron Brooks and Cole Triedman, Think Microgrid; Weston Dengler, SEPA; and Nathalie Jordi, Together New Orleans.

Participating Organizations: Schneider Electric, Bloom Energy, Enchanted Rock, SEPA, EMerge Alliance, Microgrid Resources Coalition, Tucson Electric Power, Together New Orleans, TMEIC, Dynamic Grid, Cuyahoga Green Energy, Melink Solar Development, Onyx Renewable Partners, RelyEZ Energy Solutions, and Amazon Energy.

Overview

This briefing summarizes insights from the March 2025 RE+ Microgrids Policy Workshop, hosted by RE+ Events, SEPA, EMerge Alliance, and Microgrid Resources Coalition. Throughout the workshop, developers, utilities, policymakers, and community organizations shared perspectives on advancing microgrid deployment across the United States.

Key Workshop Finding

To unlock broader microgrid adoption, customer and grid benefits must be clearly quantified and monetized, in both blue-sky (typical) and black sky (emergency) operating conditions. Utilities, project developers, and regulators must develop a common understanding of standardized approaches to valuing microgrid benefits to allow for more widespread integration of microgrids into system planning and procurement processes.

Key Workshop Topics

Participants explored the ways microgrids can help utilities:

- Keep the lights on—affordably and reliably
- Support customer resilience and sustainability
- Manage load growth from electrification
- Mitigate climate and outage-related risks
- Provide grid services related to energy dispatch and flexibility

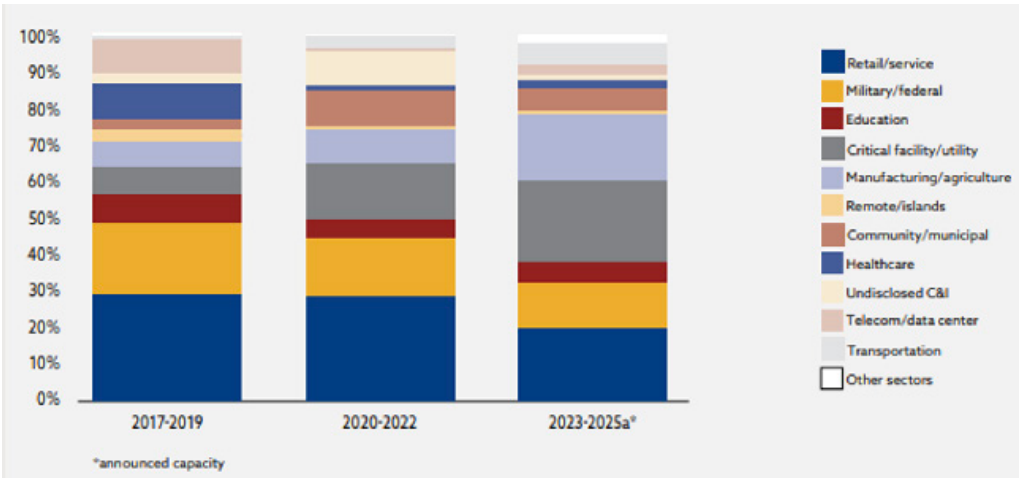
Market and Regulatory Context

Microgrids have emerged as a viable option to meet growing electricity demand, enhance distribution system capacity and flexibility, and provide site-specific resilience. Yet despite technological maturity and a rising need for localized solutions, microgrids remain underutilized in formal utility planning and regulatory frameworks.

Market Snapshot

Commercial and industrial (C&I) customers who can self-fund resilience solutions largely dominate today's microgrid market. Broader applications, such as serving critical public infrastructure, disadvantaged communities, and distribution system needs, remain constrained by policy, planning, regulatory, and valuation barriers. See the figure below for a more detailed look at the end-user segments adopting microgrids.

Figure 1. Market Capacity by End-User Segments



Source: Think Microgrid (2024). State Scorecard 2024

As part of the 2024 State Scorecard, Think Microgrid summarized insights from Wood Mackenzie on nationwide microgrid trends. Those trends include:

- As of Q3 2024, there are 5,000+ microgrid projects across the United States, totaling 9 GW of installed capacity.
- Over 1,000 MW of domestic microgrid capacity was deployed in 2024.
- New microgrid installations were highest in C&I and critical facility/utility sectors. Retail, military, education, and data centers also represented significant deployments.
- Traditional microgrids powered by fossil fuels or combined heat and power (CHP) are still operating. Advanced grid-interactive systems are increasingly deployed for public sector and resilience-focused projects.
- Microgrid-as-a-Service (MaaS) and Resilience-as-a-Service (RaaS) models are expanding third-party ownership opportunities, especially for large C&I customers.

Regulatory Gaps

Many regulators and utilities are actively exploring how to incorporate microgrids into evolving planning and procurement processes, though clear and consistent frameworks are still emerging in most jurisdictions. While microgrid technology costs are continuing to decline, microgrids themselves are not always explicitly integrated into:

- **Franchise law restrictions**. E.g., How do ownership and operations models impact the value streams of different stakeholders?
- **Existing interconnection frameworks.** E.g. How can the consideration of microgrids impact interconnection costs?
- **Microgrid Services Tariffs.** E.g. How can frameworks be developed to clarify dedicated compensation pathways?
- **Distribution system planning (DSP) and non-wires alternatives (NWA) procurements.** E.g., where can microgrid deployment defer the need for traditional system investments?
- **Performance-based ratemaking (PBR) processes.** E.g., how can performance-based incentives be designed to prioritize microgrid-enabled outcomes?
- **Virtual power plant (VPP) market design**. E.g., how can microgrid grid services be included in programs and rate designs to compensate for flexible distributed energy?
- **Community Resiliency Requirements planning.** E.g., how can microgrids meet resiliency requirements for critical facilities and community lifelines?

As one workshop participant summarized:

"The challenge is not a lack of microgrid technology—it is the absence of consistent planning, procurement, and valuation frameworks that allow these solutions to compete on equal footing with traditional infrastructure investments."

What is a Microgrid?

According to common industry definitions, the core elements of microgrids are[1]:

- **Interconnected:** Linked to the larger grid through a defined point of common coupling.
- **Intelligent:** Coordinated operation of distributed energy resources (DERs) with dynamic control systems.
- **Independent:** Ability to seamlessly island during outages to maintain service to critical loads.

Microgrid Value Streams

Microgrids are one tool in the energy toolbox to help meet customer needs, enhance energy assurance and system resilience, manage load growth, preserve power quality, and improve system flexibility. Participants noted that careful evaluation, including sophisticated comparative economic analysis techniques, can help determine locations that are best suited for microgrids.

Participants identified several major areas where microgrids can deliver value under both normal ("blue sky") and emergency ("black sky") conditions:

1 Think Microgrid (2024). Taxonomy Brief 2024

Table 1. Microgrid Value Streams	
Value Stream	**Description**
Resilience and Reliability	▪ Backup power, islanding, and black start services for critical facilities and vulnerable communities (black sky).
Grid Flexibility and Demand Management	▪ Load shifting, voltage support, frequency regulation, and peak shaving (blue sky).
Capacity Deferral and Non-Wires Alternatives (NWA)	▪ Reducing or avoiding costly transmission & distribution (T&D) investments through localized solutions (blue sky).
Renewable Integration and Emissions Reduction	▪ Enabling higher DER penetration and advancing clean energy goals (blue sky).
Community and Economic Benefits	▪ Strengthening resilience and economic opportunity for underserved regions (blue sky).

Source: SEPA, 2025

Quantifying and monetizing microgrid value streams also depends on integration and coordination across utility departments and functional areas, and input from customers and third parties:

- Customer programs and key account teams are beginning to integrate microgrids as a service offering to enhance customer resilience, particularly for critical facilities and C&I customers, aligning customer-sited distributed resources with grid needs.
- In some jurisdictions, distribution system planners and load forecasters are evaluating microgrids as an alternative to traditional investments, such as T&D upgrades, undergrounding, sectionalizing, and grid hardening, particularly where capacity relief and hosting constraints are concerns.
- System operators are beginning to establish clear interconnection and operational agreements to enable customer-owned microgrids to participate in VPPs and coordinate through Advanced Distribution Management System and Distributed Energy Resource Management System platforms. For utility-owned assets, operators can actively dispatch microgrids as part of integrated system operations.

Valuation Gaps

Participants identified specific valuation gaps that continue to limit microgrid deployment:

- Resilience, power quality, and flexibility benefits are often undervalued in benefit-cost analyses.
- The role of microgrids as a NWA to address system needs is unclear in utility distribution system plans (DSPs) and integrated resource plans (IRPs).
- Ownership and participation pathways for multi-customer and third-party microgrids are restricted in many jurisdictions.

As one workshop participant summarized:

"The challenge is not defining microgrid models. The challenge is recognizing and compensating the full range of services microgrids can provide."

Identified Barriers and Solutions for Microgrid Deployment

Barrier 1: Many Utilities Still Perceive Microgrids as a Niche Technology with Unclear Pathways to Scale

Utilities often perceive microgrids narrowly, primarily as backup systems or a stopgap for C&I load growth or boutique solutions for specific critical facilities, rather than as grid-integrated resilience, power quality, and capacity assets. In fact, microgrids are one of several tools that utilities and their customers can utilize to enhance resilience and flexibility.

Potential Solutions

- Clarify microgrids' role in utility DSP, including aggregated customer-sited behind-the-meter and grid-scale front-of-the-meter resources.
- Quantify resilience, flexibility, and capacity value streams in cost-benefit analyses.
- Ensure that microgrid assets are eligible for utility DER programs and incentives.

As one workshop participant summarized:

"We're still treating microgrids like pilots or niche projects, instead of recognizing them as part of the core toolkit for resilience and capacity."

Barrier 2: Regulatory Misalignment Across Ownership and Interconnection Models

Participants noted franchise laws, interconnection costs, and standby charges as barriers to broader deployment, describing this challenge as a policy paradox. Policies that appropriately prioritize affordability and consumer protection can sometimes unintentionally create challenges for the adoption of distributed solutions that offer grid resilience, flexibility, and localized community and customer benefits.

Potential Solutions

- Regularly update interconnection standards to include clear timelines, hosting capacity maps, and cost transparency, considering microgrid-specific provisions where appropriate.
- Provide venues for industry stakeholders to share practical challenges or use case insights related to microgrid interconnection.
- Assess regulatory authority to enable public interest use cases involving both utility and third-party microgrid ownership, including multi-customer projects to support communities and businesses.

Barrier 3: Resilience and Equity Are Not Fully Integrated into Planning and Procurement

Large C&I customers with the resources and expertise to pursue resilience solutions independently dominate today's microgrid landscape. Critical public infrastructure, disadvantaged communities, and resilience hubs often face higher outage risk and lack access to similar investments.

Potential Solutions

- Prioritize resilience hubs, critical facilities, and underserved communities in resilience funding, grant programs, and planning processes. Build capacity among community-based organizations to meaningfully participate in microgrid planning, ownership, and benefit-sharing.

- Embed outage vulnerability, equity, and climate risk metrics into DSPs, IRPs, and resilience filings.
- Design cost-benefit analysis methodologies that capture the full potential microgrid value stack, align with PBR mechanisms, and economic analyses informing NWA solicitations.
- Advance PBR and NWA processes that align utility incentives with least-cost, most-effective resilience solutions, regardless of whether they are traditional investments or DER, utility-led, or third-party-led.
- Support Microgrid-as-a-Service (MaaS) and Resilience-as-a-Service (RaaS)[2] business models to provide turnkey solutions without requiring upfront customer capital, especially for critical infrastructure and community facilities.

Barrier 4: Lack of Shared Understanding and Consistent Definitions

Varying interpretations of "microgrid" create confusion across planning, policy, and procurement processes, slowing project alignment and regulatory progress. Microgrids should be classified by:

- Interconnection Level: High-voltage transmission, primary distribution (1–35 kV), or secondary distribution (<1 kV).
- Customers Served: Single-customer vs. multi-customer systems.
- Ownership Model: Utility, public agency, or private entity.

Potential Solutions

- Adopt a shared taxonomy for microgrids based on interconnection level, customer configuration, and ownership model.
- Provide consistent education and communication across legislators, regulators, utilities, and technology providers.
- Utilize scorecards, planning frameworks, and model tariffs to reinforce common understanding.

Shared language reduces confusion and supports more consistent evaluation of grid services and customer benefits. Participants also recognized that microgrids can incorporate a range of emerging and mature technologies, highlighting the importance of revisiting definitions as technologies advance.

2 MaaS and RaaS business models allow a utility, developer, or other entity to own, operate, and maintain a customer-sited micogrid or distributed energy resource, while delivering its benefits, especially resilience and energy cost reduction, to that customer in exchange for a leasing fee.

Advancements in Microgrid Policy and Regulatory Activities

While barriers remain, participants emphasized that several states, public utility commissions (PUCs), and utilities are making meaningful progress in integrating microgrids into energy planning, regulatory structures, and resilience strategies. This momentum reflects a growing recognition that microgrids are no longer niche pilots but are emerging as grid assets.

Recent leadership activities fall into three main categories:

- State energy office-led initiatives are advancing planning frameworks, roadmaps, and grant programs.
- PUC-driven actions reforming tariffs, interconnection standards, and resilience valuation methods.
- Utility-led innovations embedding microgrids into distribution system planning, non-wires alternatives, and resilience offerings.

Table 2. Summary of Recent Microgrid Policy and Regulatory Actions

Stakeholder Type	Actions
State Energy Office	▪ Colorado Energy Office's Colorado Microgrid Roadmap (2024) ▪ Kentucky Office of Energy Policy's Commonwealth of Kentucky Regional Microgrids for Resilience Study (2021) ▪ Pennsylvania Department of Environmental Protection - Energy Programs Office Safeguarding Pennsylvania Resilient Microgrids in Our Communities Report ▪ West Virginia Office of Energy's West Virginia Regional Microgrid Study ▪ Maryland Energy Administration's Resilient Maryland Program ▪ Wisconsin Office of Energy Innovation's Critical Infrastructure Microgrid and Community Resilience Center Pilot Grant Program
PUC	▪ California and Hawaii established dedicated microgrid tariffs (CPUC Docket No. 19-09-009, Hawaii Docket No. 2018-0163). ▪ Maine PUC is exploring resilience planning and utility-owned energy storage, while enabling certain third-party-owned multi-customer microgrids and resilience planning (Docket No. 2024-00191, Docket No. 2023-00316, LD 1053). ▪ Connecticut PURA's proposed Integrated Distribution System Planning is moving towards requiring categorical evaluation of non-wires solutions (Docket No. 21-05-15RE03). ▪ Maryland SB 1083 mandates integrated resilience and DERs in DSPs. ▪ Colorado PUC is establishing NWA solicitation processes tied to DSP needs identification (Docket No. 24A-0547E). ▪ New York PSC approved the Energy Storage Roadmap (2024), integrating microgrids into resilience planning.
Utility	▪ Duke Energy is evaluating microgrids as non-traditional capital investments within DSPs. SEPA and Duke Energy's Hot Springs Microgrid Case Study highlighted what that evaluation process looks like in practice. ▪ Utilities like Entergy New Orleans, Florida Power & Light, Georgia Power, and Xcel Energy are advancing Resilience-as-a-Service programs using utility-led microgrid deployment. ▪ Maine utilities are starting to incorporate microgrid assessments into DSP filings (Docket No. 2022-00322). ▪ Xcel Energy Colorado is linking DSP needs identification to NWA solicitations, prioritizing resilience projects

Source: SEPA, 2025

Common Elements Across Leading States

Several common practices are emerging among early leaders:

- Resilience planning mandates are tied to distribution system plans (DSPs), integrated resource plans (IRPs), or broader grid modernization filings.
- Dedicated microgrid tariffs or regulatory guidance enabling ownership, interconnection, and multi-customer models.
- Cross-agency coordination aligning state energy offices, PUCs, utilities, and emergency management stakeholders on resilience objectives.
- Integration of equity, vulnerability, and climate risk metrics into planning, funding, and program design.

Potential Next Steps and Considerations

Building on insights shared throughout the workshop and highlighted in this briefing, participants identified a set of next steps to accelerate the deployment and integration of microgrids into utility planning, regulatory frameworks, and resilience strategies.

These considerations aim to move beyond pilot projects and demonstration programs, positioning microgrids as core components of a resilient, affordable, and clean energy system.

Planning and Valuation

- Integrate microgrid solutions into distribution system plans (DSPs), integrated resource plans (IRPs), and non-wires alternatives (NWA) evaluations as standard options.
- Adopt standardized benefit-cost analysis methodologies that capture resilience, flexibility, and capacity deferral benefits, building on tools such as the LBNL Resilience Planning Template and Maryland's SB 1083 framework.

Policy and Regulatory Alignment

- Establish clear regulatory pathways to enable multi-customer and third-party-owned microgrids, considering models set by California, Hawaii, and Maine.
- Modernize interconnection standards to include transparent timelines, cost structures, and hosting capacity data.
- Align procurement frameworks with resilience, equity, and flexibility outcomes—moving beyond technology-specific requirements toward performance-based solicitations.

Community Resilience

- Prioritize microgrid and resilience investments for critical public infrastructure, resilience hubs, and underserved communities.
- Embed equity, outage vulnerability, and climate risk metrics into utility and state planning processes.
- Support MaaS and RaaS models to expand access to resilience solutions without upfront capital requirements.

Partnerships and Market Development

- Encourage collaboration between utilities, developers, policymakers, and communities through co-development models and public-private partnerships. Utilities play a critical role as partners in evaluating, integrating, and operating microgrids to ensure alignment with system needs and reliability standards.
- Expand education and capacity-building efforts for policymakers, regulators, utilities, and community organizations on microgrid integration, valuation, and ownership structures.
- Promote knowledge-sharing and replication of successful models.

Continued collaboration across utilities, regulators, policymakers, technology providers, and communities will be critical to fully realizing the potential of microgrids as resilience and grid flexibility assets. Aligning planning processes, regulatory frameworks, and funding mechanisms with the full value of microgrids can transform them from niche solutions into core

components of a more resilient, affordable, and sustainable grid. The examples, insights, and next steps outlined in this briefing provide a foundation for actionable progress.

Opportunities and Continued Dialogue

- **SEPA Resilience Working Group -** Ongoing collaboration among utilities, developers, and regulators to share best practices and accelerate deployment.

  Contact Mac Keller for participation details.
- **Think Microgrid open teach-ins -** Monthly calls open to the microgrid community featuring experts speaking to diverse use cases, barriers, and solutions.
- **Partner Initiatives -** Think Microgrid, MRC, and EMerge Alliance will continue convening stakeholders through webinars, working groups, and policy engagements focused on scaling microgrids.

Real-World Examples: State Leadership and Project Snapshots

In addition to policy and regulatory advancements, real-world project deployments demonstrate how microgrids are being leveraged today to deliver customer and grid benefits.

Louisiana: Together New Orleans Resilience Hub Network and Statewide Distributed Resilience Strategy

Our workshop host state, Louisiana, and host city, New Orleans, are taking multi-dimensional approaches to accelerating microgrid deployment and bolstering distributed resilience. Workshop participants heard from a local organizer on the work of Together New Orleans, a broad-based coalition of local congregations and community-based organizations involved in one of the region's most ambitious community-driven resilience efforts. Together, New Orleans, Entergy New Orleans, and the New Orleans City Council are partners to provide customer-owned, behind-the-meter (BTM) solar PV and battery storage microgrids serving as resilience hubs for critical community facilities. The purpose is to provide backup power during disasters, generate economic benefits for host sites, and aggregate storage resources for peak demand management through a virtual power plant (VPP) model. They are using an integrated funding model leveraging public, philanthropic, and private capital. Through utility and developer-aligned business models and programs, the storage assets can be aggregated and dispatched for grid services.

Next Steps: Finalizing rate design and compensation mechanisms through the regulatory approval process and coordination with Entergy New Orleans to support VPP aggregation and long-term project sustainability. They are implementing a $249M federal grant to expand the model statewide.

"This initiative puts power back into the hands of communities most impacted by outages—while also creating grid value."
- Nathalie Jordi, Together New Orleans

Bloom Energy, AWS, and AEP Ohio – Hyperscale Data Center Microgrid Partnership

At the workshop, participants also heard from project leaders involved in a collaboration between Bloom Energy, AWS, and AEP Ohio. This partnership demonstrates how modular, dispatchable microgrids can be deployed to meet urgent capacity needs for hyperscale data centers, while aligning with long-term utility system planning objectives. The project highlights an emerging model where customer-driven energy demands, innovative technologies, and utility planning are integrated to deliver resilient, scalable solutions during periods of rapid load growth.

Bloom Energy (technology provider), AWS (customer), AEP Ohio (utility) are partnering on a utility-integrated modular solid oxide fuel cell microgrid providing dispatchable, on-site generation to meet interim capacity needs for a hyperscale data center cluster. It will provide immediate, scalable baseload power to meet urgent customer load requirements while longer-term transmission and distribution (T&D) upgrades are completed.

- The collaboration is ensuring alignment between temporary microgrid solutions and permanent T&D expansion plans. Project partners will provide a potential blueprint for utility-customer-technology partnership models in high-growth areas.

"This is not a backup generator—it's a utility-grade dispatchable asset meeting both system needs and customer reliability requirements."
- Charles Fox, Bloom Energy

Appendix - Workshop Presentations

The workshop included presentations from panelists and instructors:

- **Jeff Morris (Senior Director State Government Relations, Schneider Electric North America)** discussed microgrid policy barriers, highlighting challenges associated with creating clear and common definitions, developing DER tariffs to compensate DERs for grid services, supporting clear, published and standard interconnection rules, and creating a performance-based compensation system to reflect how DERs can lower costs of electrification or digitization for customers. Jeff also highlighted project successes in MD and CA.
- **Charles Fox (VP, Bloom Energy)** discussed how fuel cell microgrids can provide immediate, modular baseload power to C&I facilities and data centers that are unable to interconnect to the grid immediately.
- **Cameron Brooks and Cole Triedman (Executive Director and Policy Director, Think Microgrid)** presented on changes in the second annual State Scorecard. The Scorecard presents a regulatory policy landscape characterized by incremental progress in jurisdictions like Puerto Rico, Maine, and Louisiana, and remaining policy barriers to scaling and diversifying microgrid deployment across every state.
- **Weston Dengler (Senior Analyst, Research and Industry Strategy, SEPA)** discussed the importance of incorporating DERs into utility planning. Weston highlighted the role that DERs can play in building resilience in communities and at critical facilities, as well as the importance of prioritizing critical facilities and communities for resilience investment based on service reliability, natural hazard risks, and equity considerations.
- **Nathalie Jordi (Together New Orleans)** presented on the coalition's effort to build community resilience hubs at churches, health centers, and other community centers across the city of New Orleans. Nathalie highlighted the importance of building relationships with diverse congregations and other community-based organizations to address community resilience.

1800 M STREET, NW FRONT 1
#33159
WASHINGTON, DC 20036
202-857-0898

©2025 Smart Electric Power Alliance. All Rights Reserved.