

Battery Energy Storage System Deployment by Rural Electric Cooperatives

Key Findings

- NRECA identified 180 BESS projects across cooperative service territories, including 96 operational projects and 71 anticipated projects.
- Across all identified projects, electric cooperatives are expected to add approximately 1,004 MW of power capacity by 2031 — a 135% increase from 1,160.4 MW that is already operational.
- Solar-plus-storage is emerging as a major configuration for hybrid projects. Solar PV capacity tied to operational storage systems total 786 MW, and 854 MW among anticipated hybrid projects.
- Peak shaving and energy service reliability and resilience are the primary use-cases for the BESS projects identified.

Introduction

Battery energy storage systems (BESS) have experienced rapid growth in the U.S. electric power sector in recent years. According to the U.S. Energy Information Administration (EIA), 6.4 GW of utility-scale battery storage was added in 2023, followed by 10.4 GW in 2024. Recent data from EIA show a record 15 GW in 2025 — a 134% increase in BESS capacity within just two years.^{1,2} This growth is expected to continue, with developers planning ~24 GW of additional utility-scale battery storage in 2026, including 3.4 GW in California alone.³

As battery storage deployment grows, electric cooperatives⁴ are also exploring how BESS can support their systems and members. This advisory summarizes battery energy storage projects among electric co-ops, providing an overview of project size, technology, operational status, and other key characteristics. All information within this advisory is sourced from publicly available data to track the battery storage projects owned or contracted by electric co-ops.

¹ U.S. Energy Information Administration, "Solar and Battery Storage to Make Up 81% of New U.S. Electric-Generating Capacity in 2024," *Today in Energy*, February 15, 2024, <https://www.eia.gov/todayinenergy/detail.php?id=61424>

² U.S. Energy Information Administration, "U.S. Battery Capacity Increased 66% in 2024," *Today in Energy*, March 12, 2025, <https://www.eia.gov/todayinenergy/detail.php?id=64705>

³ U.S. Energy Information Administration, "New U.S. Electric Generating Capacity Expected to Reach a Record High in 2026," *Today in Energy*, February 20, 2026, <https://www.eia.gov/todayinenergy/detail.php?id=67205>

⁴ While "electric cooperatives" or "co-ops" will be used, these figures include NRECA's rural public power, tribal, and mutual utility members as well

Battery Energy Storage Systems at Rural Electric Cooperatives

NRECA is tracking more than 100 BESS projects that are utility-owned or third-party-owned, where the electric co-op is the off-taker through a power purchase agreement.⁵ In total, there are 180 projects in different stages of development, and are concentrated in North Carolina with 50 projects, followed by Indiana (18) and Colorado (11), as shown in Figure 1. Several other states, including Virginia, Arizona, Alaska, New Mexico and Texas, also show significant numbers of BESS projects, and the rest of the country is peppered with BESS activity, which attests to the growing interest of co-ops in utilizing energy storage technologies in their systems.

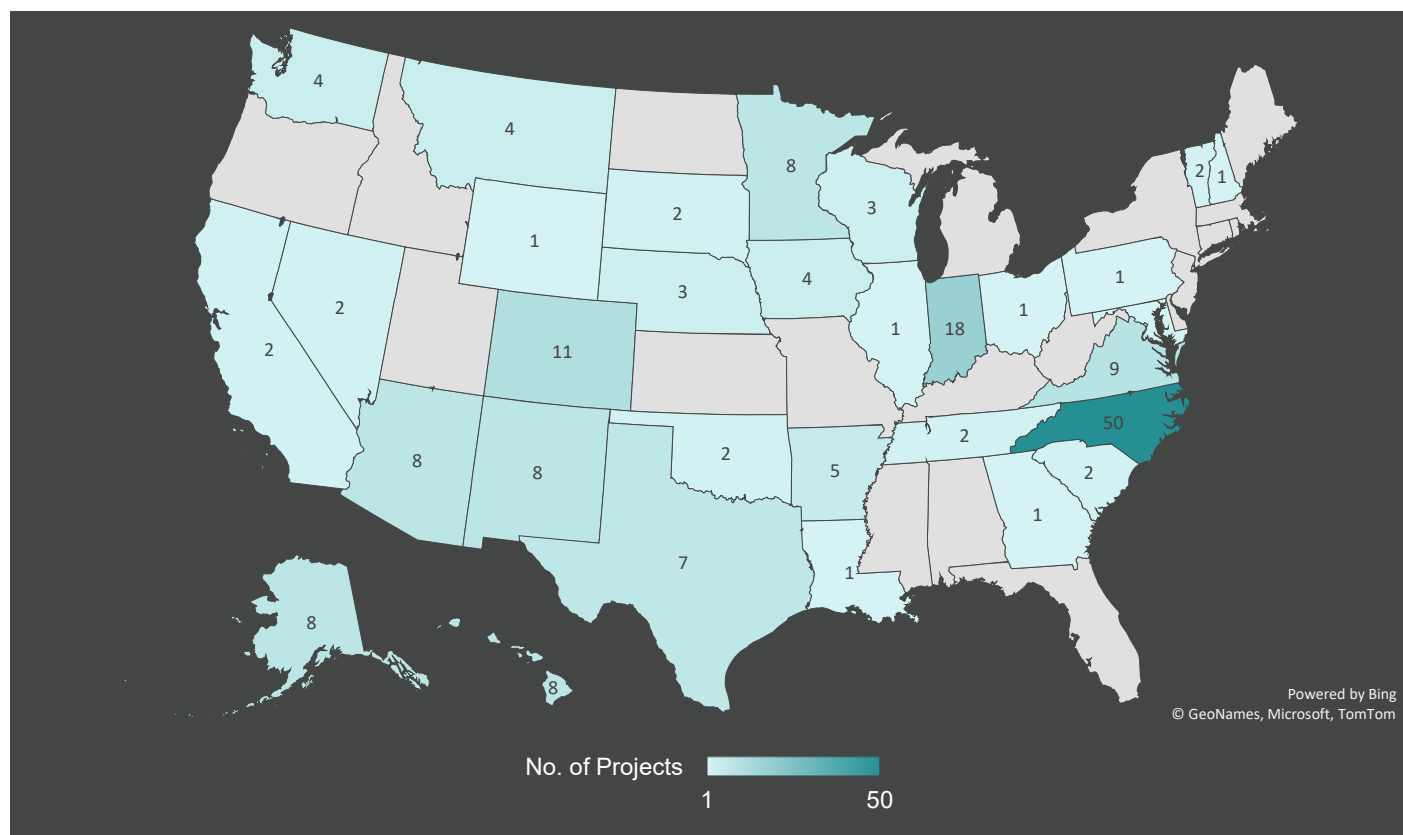


Figure 1. Overall BESS Projects at Rural Electric Utilities

Among the 180 tracked projects, 95 are already operational and the rest are still under development. Commissioned BESS projects in North Carolina (38) significantly outnumbers those in other states, as shown in Figure 2. This is followed by Arizona and Alaska with seven projects each, and Colorado with six. The projects in North Carolina also demonstrate a range of system sizes, with power capacities ranging from 0.23 MW to 15 MW, highlighting the diversity of BESS deployments within co-op service territories. Among the largest projects identified are Western Farmers Electric Cooperative's Skeleton Creek Solar + Wind + BESS project in Oklahoma that was completed in December 2025. This project involved adding a 252 MW BESS and 250 MW solar alongside the co-op's existing 250 MW wind farm.⁶ Another large battery system is Arizona Electric Power Cooperative's (AEP) Apache II Solar Project with BESS in Cochise, Arizona. Commercial operations began in January 2026, with the facility consisting of a 298 MW solar

⁵ Information was gathered from publicly available sources.

⁶ Western Farmers Electric Cooperative, "Our History," accessed September 10, 2026, <https://www.wfec.com/about-our-history>

paired with 235 MW of battery energy storage.⁷ Other large systems include the AEPCO Nucor BESS (50 MW), Homer Electric Association's BESS (46.5 MW), Golden Valley Electric Association's BESS (46 MW), and Chugach Electric Association's South Campus BESS (40 MW).

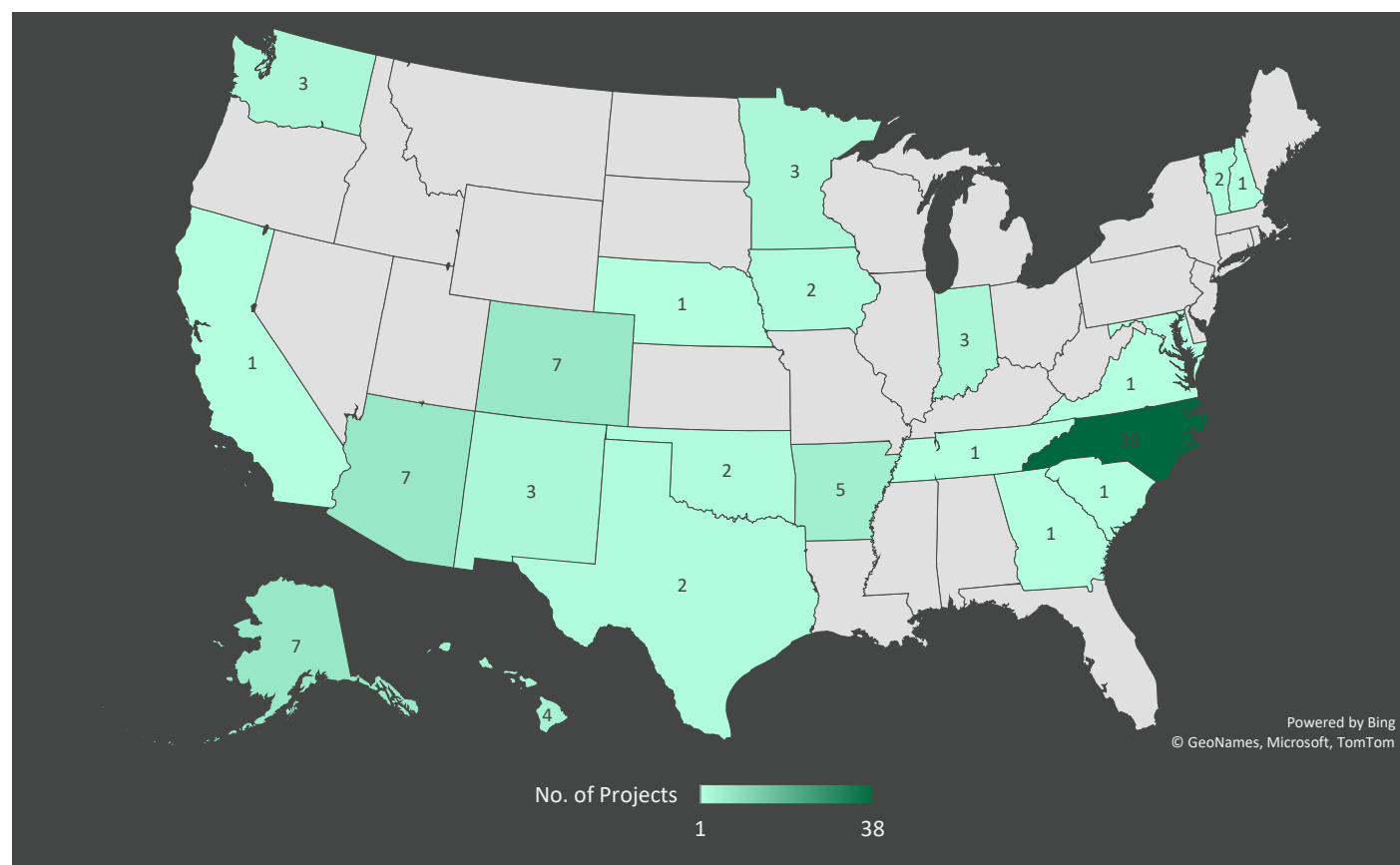


Figure 2. Rural Electric Utilities' Operational BESS Projects

Figure 3 illustrates the geographic distribution of 72 anticipated BESS projects located within electric cooperative service territories across the United States. The projects are concentrated in several states, with Indiana accounting for the largest number at 15 projects, followed by Virginia with eight projects. Compared with operational BESS projects, in-progress projects show a broader geographic distribution, reflecting the growing interest among electric co-ops in adopting energy storage technologies. In Louisiana, the Louisiana Public Service Commission approved DEMCO's proposed 100 MW Amite Solar Energy Center battery energy storage project, which will be paired with the 100 MW Amite Solar facility in Tangipahoa Parish.⁸

⁷ Clēnera, "Commercial Operations Begin at Clēnera's Roadrunner Solar Facility," January 22, 2026, <https://www.clenera.com/news/commercial-operations-begin-at-cleneras-roadrunner-solar-facility>.

⁸ Louisiana Public Service Commission, Order No. U-37799: Dixie Electric Membership Corporation, Amite Solar, LLC and Amite Energy Storage, LLC, June 12, 2026, <https://lpscpubvalence.lpsc.louisiana.gov/portal/PSC/ViewFile?fileId=31FES1qKblU%3D>

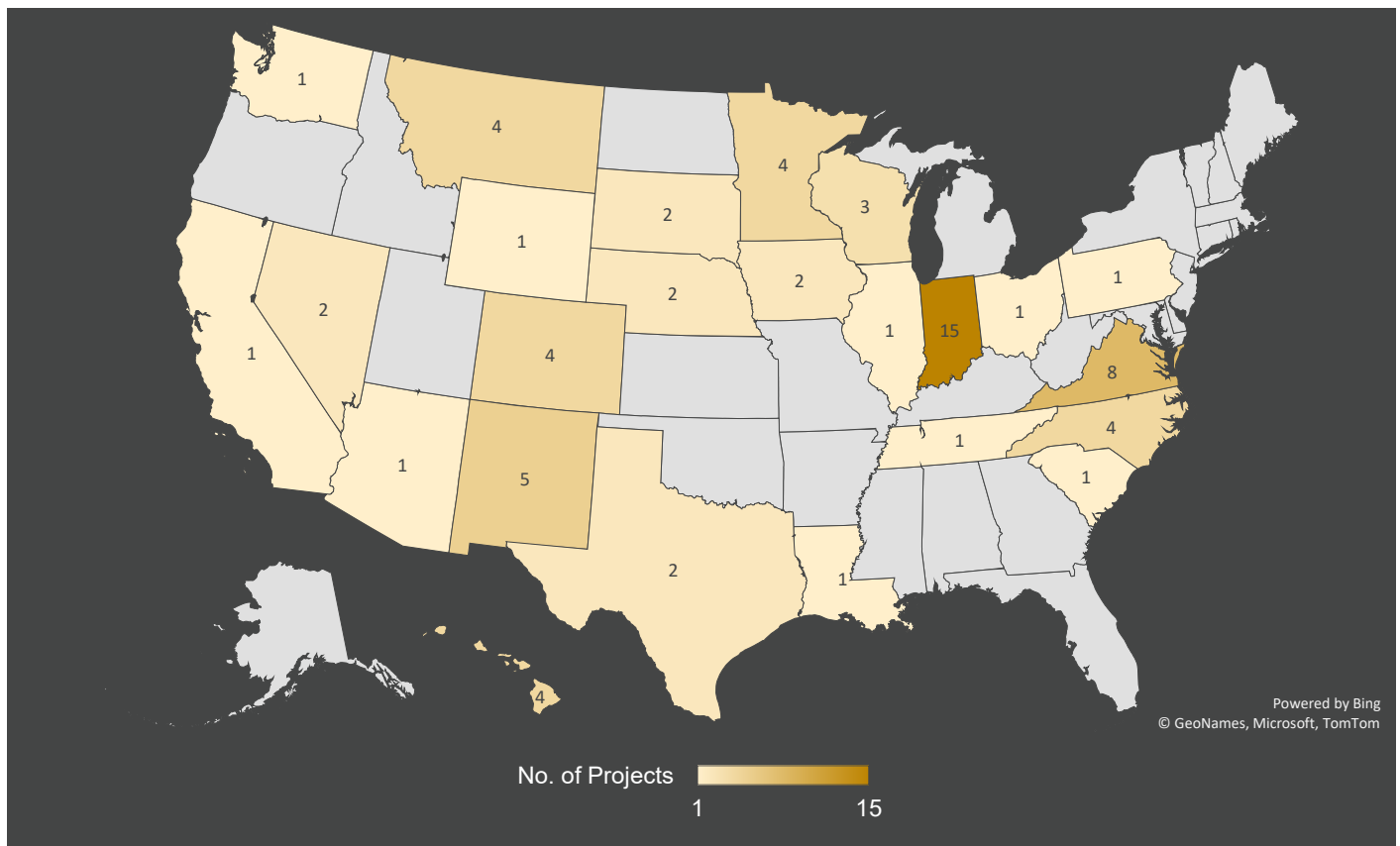


Figure 3. Anticipated BESS Projects by Rural Electric Utilities

The BESS projects identified within electric co-op service territories represent a wide range of system sizes and storage capabilities, as detailed in Table 1. Across all identified projects, total power capacity reaches 2,572 MW, with a combined rated storage capacity of 7,103 MWh. Individual projects range from 0.04 MW to 252 MW in power capacity, with a median of 4 MW, demonstrating the diversity of BESS deployments across co-op systems — from smaller distributed installations to large utility-scale projects.

Operational projects currently account for 1,160 MW of capacity and 3,800 MWh of energy, while anticipated projects represent an additional 1,004 MW and 2,711 MWh. Although operational projects have greater total capacity, anticipated projects have higher median power and energy, at 4.5 MW and 15.7 MWh, respectively, compared with 3 MW and 8 MWh for operational projects. This difference suggests that BESS projects currently under development may be trending toward larger systems.

The anticipated projects indicate substantial growth in BESS capacity within electric co-op service territories over the coming years. The 1,004 MW of anticipated power capacity and 2,711 MWh of rated energy output identified in the project pipeline are expected to come online by 2031. Relative to the current operational portfolio, these projects represent an additional 71% of existing operational storage capacity. If all anticipated projects are completed as planned, the identified operational and anticipated portfolio would reach approximately 6,511 MWh of storage capacity by 2031, excluding projects for which the development status is currently unknown.

Table 1. Power and Storage Capacity of BESS Projects

	Operational	Anticipated	All Projects ⁹
Total Power Capacity (MW)	1,160	1,004	2,572
Total Rated Energy (MWh)	3,800	2,711	7,103
Median Power Capacity (MW)	3	4.5	4
Median Rated Energy Capacity (MWh)	8	16	10
Minimum Power Capacity (MW)	0.04	0.06	0.04
Maximum Rated Energy Capacity (MWh)	252	200	252

Figure 4 illustrates the commissioning timeline of BESS projects within electric co-op service territories, along with projects currently anticipated to come online through 2031. BESS deployment remained limited through the early years of the dataset, with only a small number of projects commissioned annually through 2016. Deployment began to accelerate in 2017, followed by a significant increase in 2021, when 20 projects were commissioned, the highest annual total among operational projects. An additional 16 projects were commissioned in 2022, followed by a decline to five projects annually in 2023 and 2024. Commissioning activity increased again in 2025, with nine projects coming online.

The increased interest of electric co-ops in energy storage projects may be attributed to the technology's improving price profile. In recent years, prices of lithium have declined, and the availability of direct-pay investment tax credit and battery storage installation credits from the Inflation Reduction Act (IRA) allows co-ops to benefit from energy storage technologies.^{10,11} Funding streams made available in recent years from federal, state, and local governments have also allowed rural electric co-ops to partly cover BESS project costs.

⁹ The values under *All Projects* do not reconcile with the operational and anticipated capacities, because some projects have unknown development status, and therefore could not be categorized between *Operational* and *Anticipated*.

¹⁰ Joseph Bouchard, "New Lithium Discoveries Can Secure America's Clean Energy Future," Text, The National Interest (The Center for the National Interest, January 24, 2024), <https://nationalinterest.org/feature/new-lithium-discoveries-can-secure-america%E2%80%99s-clean-energy-future-208808>.

¹¹ NRECA, "Treasury/IRS Direct-Pay (Elective Pay) Credits," Cooperative.com, June 16, 2023, <https://www.cooperative.com/programs-services/government-relations/regulatory-issues/Pages/Secure/Direct-Pay-Credits.aspx>.

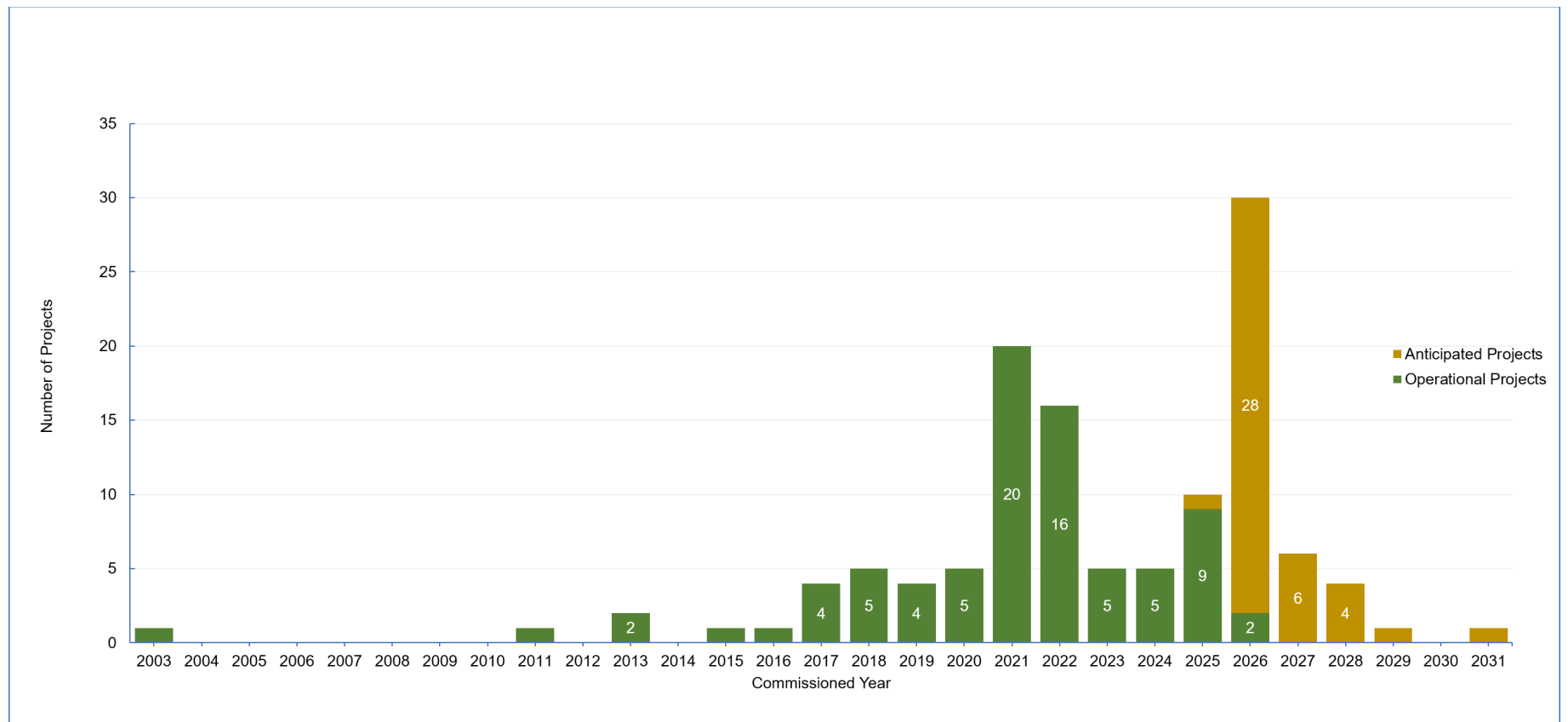


Figure 4. Rural Electric Utilities' BESS Projects Commissioning Timeline

The intended use-cases for the operational BESS projects within electric co-op service territories are shown in Figure 5. The results indicate that co-ops are deploying BESS primarily to address peak demand, reliability, and resilience needs. Peak shaving is the most frequently identified application, associated with 66 projects. Using BESS for electric service reliability and resilience and microgrid applications are also prominent.

It is important to note that these applications are not mutually exclusive. Some co-ops are pursuing value-stacking, in which a single BESS is used to provide multiple services or address multiple system needs. For example, a project may be designed to reduce peak demand while also providing backup power, supporting renewable energy integration, or serving as part of a microgrid. As a result, the application counts shown in Figure 5 exceed the number of individual BESS projects and should be interpreted as the number of projects associated with each intended use case, rather than as mutually exclusive project categories.

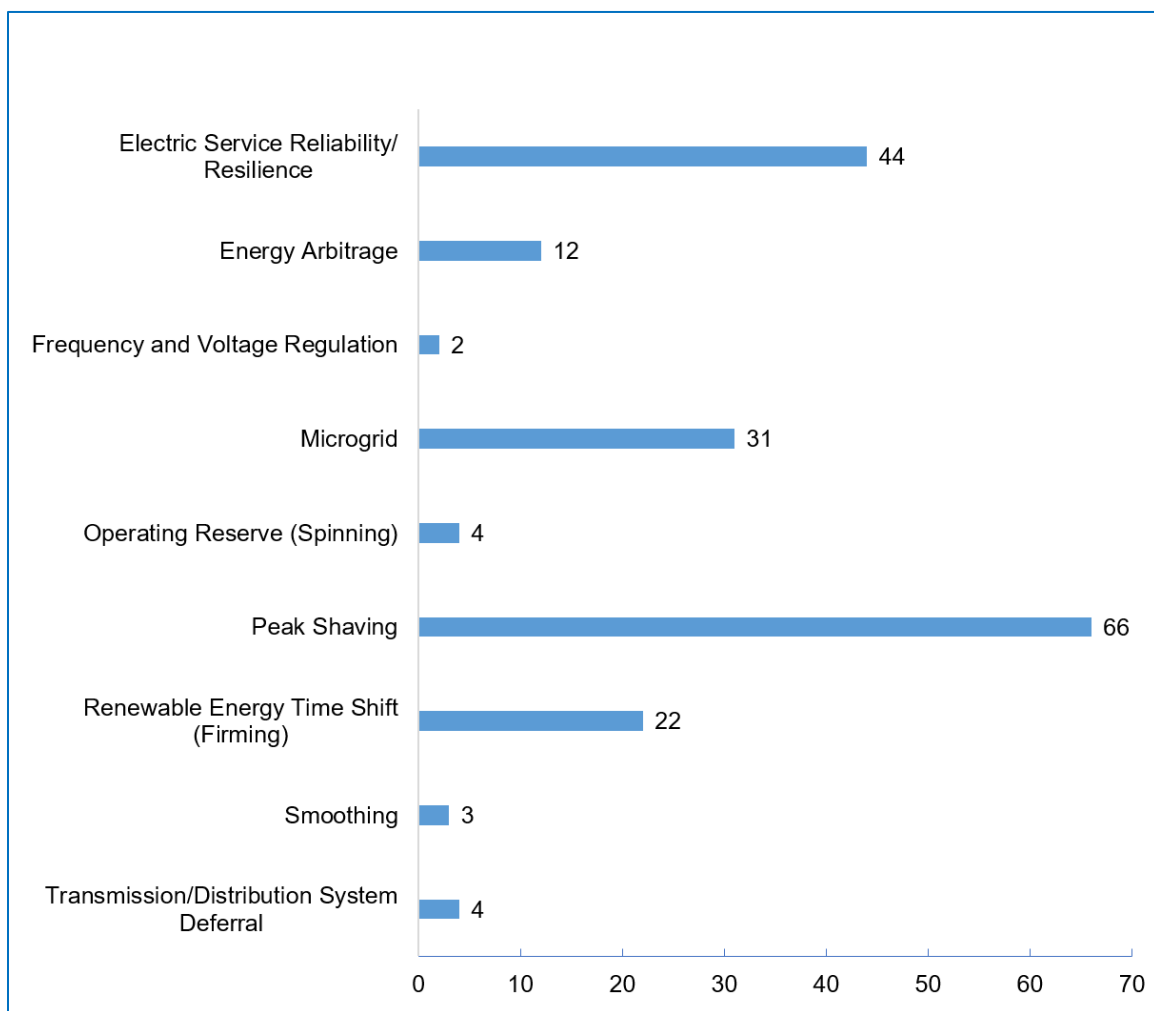


Figure 5. Intended Applications for the Operational BESS Projects¹²

¹² Application categories are not mutually exclusive, as some BESS projects employ value-stacking to serve multiple use cases.

Lithium-ion is by far the predominant battery chemistry among projects with chemistries identified (Table 2). Of the lithium-ion projects for which a specific chemistry was identified, 12 use lithium-iron phosphate (LFP), a lithium-ion chemistry commonly used in stationary energy storage. The remaining identified projects include one lead-acid system and one flow battery system, with the flow battery using vanadium chemistry. The predominance of lithium-ion technology among the identified BESS projects reflects its combination of high efficiency, fast response, high energy density, declining costs, and a mature manufacturing and supply chain. Lithium-ion is the dominant chemistry for utility-scale battery storage, citing its high-cycle efficiency, rapid response times, and high energy density.¹³ Particularly for stationary energy storage, LFP has become particularly prominent within the lithium-ion family. LFP batteries generally have lower energy density than some other lithium-ion chemistries, but offer advantages including long cycle life, high power capability, and strong thermal safety characteristics.¹⁴ But the future, three electric co-ops in Iowa, Illinois, and Wisconsin will be commissioning their projects that uses vanadium redox flow batteries some with long duration applications. Vanadium flow batteries are well suited to stationary, longer-duration applications and offer advantages including long cycle life, high safety, and deep-discharge capability.¹⁵

Table 2. Battery Chemistry of the Operational BESS Projects

BESS Chemistry	No. of Projects
Lithium-ion	46
<i>Lithium-iron phosphate (LFP)</i>	12
Lead acid	1

Figure 6 illustrates the generation resources paired with operational and anticipated BESS projects. Among these projects, solar photovoltaics (PV) is the predominant paired resource, accounting for 786 MW of operational BESS capacity and 854 MW of anticipated capacity. Wind is the second-largest paired resource among operational projects, with 265 MW, while hydropower and fossil fuel generators account for comparatively smaller amounts of paired BESS capacity.

The anticipated hybrid project portfolio is particularly concentrated around PV, with 854 MW of anticipated BESS capacity paired with solar generation. This suggests that solar-plus-storage is becoming an increasingly important configuration for new BESS development among electric co-ops, allowing storage to complement variable solar generation by shifting energy to periods when solar output declines and providing additional flexibility to the electric system.

¹³ U.S. Energy Information Administration, "Most Utility-Scale Batteries in the United States Are Made of Lithium-Ion," Today in Energy, October 30, 2019.

¹⁴ U.S. Department of Energy, *Energy Storage Safety Strategic Plan*, May 2024.

¹⁵ National Renewable Energy Laboratory, "Energy Storage," *Energy Exchange 2024*, 2024.

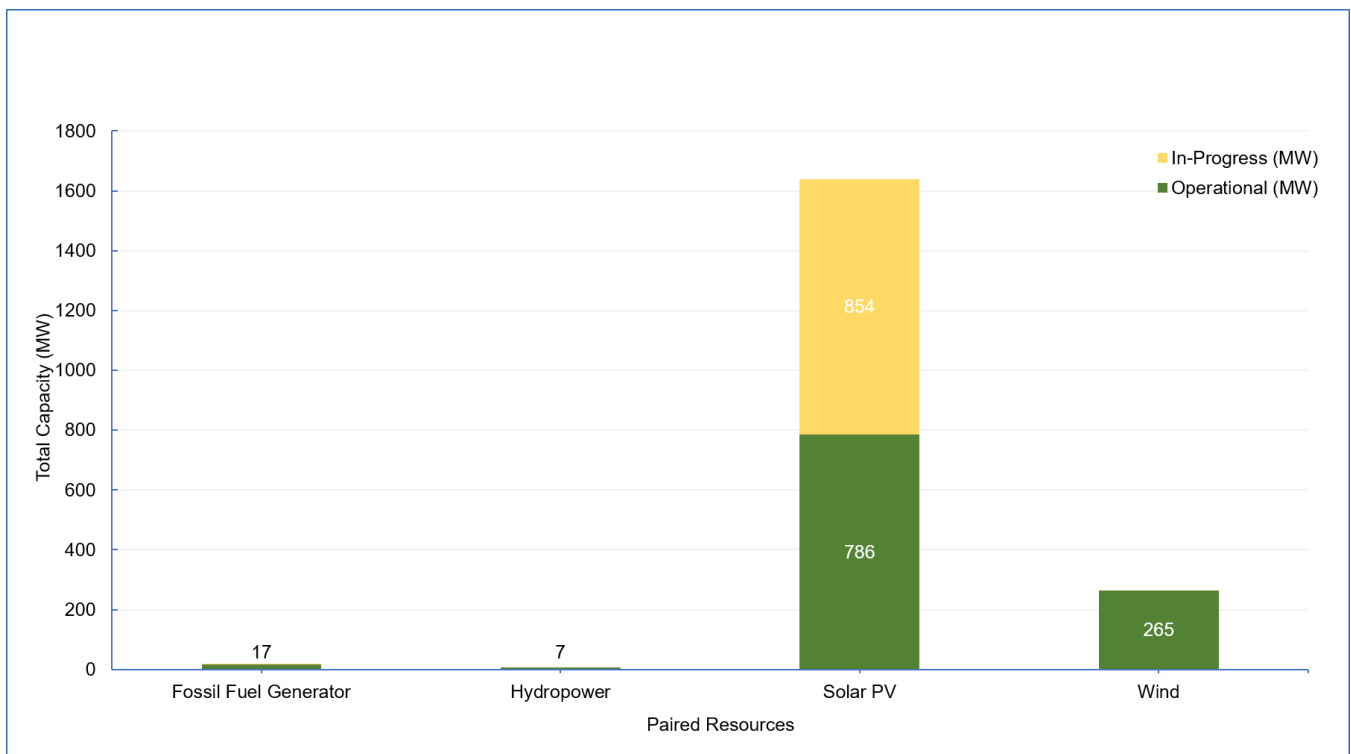


Figure 6. BESS Capacity of Hybrid Projects by Paired Generation Resource

Conclusion

The deployment of battery energy storage systems among electric co-ops is expanding in both scale and geographic reach. With 96 projects already operational and 71 additional projects anticipated, the data indicate continued growth in co-op adoption of BESS through 2031. Operational projects currently represent approximately 1,160 MW/3,800 MWh of capacity, while anticipated projects would add another 1,004 MW/2,711 MWh.

The findings also demonstrate that co-ops are using BESS primarily to address peak demand, reliability, and resilience needs, while increasingly pairing storage with solar generation. Lithium-ion remains the dominant technology, although alternative chemistries such as vanadium flow batteries are beginning to emerge. Overall, the results suggest that BESS is becoming an increasingly important resource for co-ops seeking greater flexibility, reliability, and asset diversity across their systems.

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Additional Resources

As part of a previous research project, the Outreach for Advanced Storage Integration and Support ([OASIS](#)) project,¹⁶ NRECA Research released a report last October on BESS deployment by our members. That report, and an associated webinar are available [here](#).

In addition, as part of the Rural Energy Storage Deployment Program ([RESDP](#)),¹⁷ NRECA Research worked with the Pacific Northwest National Laboratory (PNNL) to produce a Battery Energy Storage System Safety Report focused on the importance of codes and standards for BESS safety, which can be found [here](#).

Contact for Questions

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¹⁶ OASIS was a federally funded initiative aimed at providing NRECA members access to educational tools and resources to empower them to integrate energy technologies with their generation systems.

¹⁷ The goal of the RESDP program is to successfully deploy battery storage systems at rural critical infrastructure served by electric cooperatives to increase resiliency, improve system efficiency and to collect best practices and lessons learned from these deployments with electric cooperatives across the country.