

Deploying Advanced Batteries to Strengthen Rural Electric Systems and to Maximize the Value of Renewable Power

Applicant	The National Rural Electric Cooperative Association Cooperative Research Network	
Principal Investigator	Dale Bradshaw	
Project Director	Craig Miller, Ph.D.	
Participants: NRECA is submitting the proposal in conjunction with the following cooperatives.		
	Kauai Island Utility Cooperative (HI)	Kotzebue Electric Association (AK)
	Central Electric Power Cooperative (SC)	Seminole Electric Cooperative (FL)

The National Rural Electric Co-operative Association (NRECA) and its research arm, the Cooperative Research Network (CRN), has assembled a team of co-ops to test, demonstrate, and evaluate multiple uses and benefits of advanced Zinc Bromide (ZnBr) batteries manufactured in the US by Premium Power Corporation. The diverse utilities offer a variety of climates and uses to meet the objectives of the Energy Storage Competiveness Act in the EISA of 2007:

- integrate with solar and wind intermittent production;
- improve security for a military base with emergency backup power;
- optimize T&D operation, reducing congestion and losses, and avoiding T&D upgrades;
- provide peak load management.

In total nine TransFlow 2000s will be installed, tested, and demonstrated storing 31.5 MWh and providing 4.5 MW of peak output. The specific projects are as follows:

1. **Central Electric Power Cooperative Inc. (CEPCI)**, a generation and transmission (G&T) co-op in South Carolina, will install two PPC TransFlow 2000s (3.7 MWh per unit) at a T&D interface primarily to improve local reliability, reduce transmission congestion, and reduce demand charges.
2. **Seminole Electric Cooperative Inc. (SECI)**, a generation and transmission (G&T) co-op in Florida, will install two PPC TransFlow 2000s (2.8 MWh per unit) at a distributed T&D interface primarily to manage the intermittency of a 5 MW solar PV installation as well as shave daily peaks and provide demand management (arbitrage).
3. **Kauai Island Utility Cooperative (KIUC)**, an island distribution co-op in Hawaii that functions as a G&T co-op as well, will install four PPC TransFlow 2000s (3.7 MWh per unit) at the end of a radial line serving a military installation (Pacific Missile Range Facility or PMRF) to improve grid reliability, provide frequency regulation and spinning reserve as needed, shift solar production to be coincident with KIUC peaks, and provide emergency backup power for consumers through self-healing grid features.
4. **Kotzebue Electric Association (KEA)**, an isolated distribution co-op in Alaska that also functions as a G&T co-op, will install one PPC TransFlow 2000 (3.7 MWh) to shift a wind turbine from off-peak to on peak, reduce diesel generation operation and number of starts, improve system efficiency, reduce expensive consumption of diesel fuel, and provide frequency regulation and spinning reserve as needed.