DOOSAN GridTech

AUSTIN SHINES BESS

Capacity
3MW / 6MWh

Location
Austin, Texas

Pioneering Holistic DER Integration Through the DOE

About the Client

Austin Energy is the eighth largest publicly owned electric utility in the United States, serving more than 460,000 customers across the City of Austin and parts of Travis and Williamson Counties. Guided by its community's sustainability values, Austin Energy has set ambitious renewable goals, including 65% renewable energy by 2027, 200MW of local solar, 100MW of customer-sited solar, and net-zero community-wide greenhouse gas emissions by 2050.

As an early participant in the U.S. Department of Energy's SHINES (Sustainable and Holistic Integration of Energy Storage and Solar PV) program, Austin Energy partnered with Doosan GridTech to pioneer a model for holistic distributed-energy integration that is now influencing utilities nationwide.

The Challenge: Managing High Renewable Penetration

By 2016, renewable generation accounted for nearly a third of Austin Energy's supply mix; a sharp rise that tested distribution-grid stability and market operations. The utility needed to:

- Mitigate renewable intermittency and avoid reverse power flow on feeders with high PV penetration.
- Integrate utility-scale, commercial, and residential resources under one coordinated control framework.
- Maintain affordability while achieving aggressive carbon-reduction targets.
- Develop a repeatable, scalable model for DER (DERMS) management that other utilities could adopt.

The DOE's $4.3 million SHINES grant challenged Austin Energy to demonstrate that high solar PV penetration could coexist with grid reliability and economic value, targeting a levelized cost of energy (LCOE) of 14¢/kWh on feeders with high distributed solar.

Client	Role	Commissioned	Market
Austin Energy	System Integrator	2018 & 2020	ERCOT

Doosan GridTech's Solution

Doosan GridTech served as both technology provider and system integrator, delivering the architecture, controls, and two turnkey energy storage systems that anchored Austin Energy's SHINES program.

Core Solution Elements

- **Utility-Scale Energy Storage Systems:**
  - Two 1.5MW / 3MWh lithium-ion BESS installations at the Kingsbery and Mueller Substations, integrated with the 2.6MW La Loma Community Solar Farm.
  - Each system supports solar mitigation, voltage support, and day-ahead / real-time price dispatch.

- **Commercial and Residential DER Integration:**
  - Aggregated distributed resources including commercial batteries (18kW – 72kW systems), rooftop PV, home energy storage (10kWh units), and vehicle-to-grid (V2G) resources, totaling nearly 6MW of assets across the feeder network.
  - Integration of ConnectDER™ smart meter collars to simplify residential solar connectivity and reduce installation costs.

- **Control Platform – DERMS and Intelligent Controllers:**
  - Dosan GridTech Intelligent Controller® (DG-IC®): Deployed at both grid-scale sites to manage local charge/discharge, power quality, and autonomous operation.
  - Doosan GridTech Distributed Energy Resource Optimizer® (DERO®): Centralized DERMS coordinating all assets, utility-scale, commercial, and residential, in real time using open standards (MESA, SunSpec, OpenADR).
  - Combined, DG-IC® and DERO® created a multi-layered control system capable of fleet-level optimization and microgrid-ready autonomy.

- **Open Standards Framework:**
  - Implemented MESA, SunSpec, and OpenADR protocols for interoperability and cybersecurity, a foundation for future-scale DER integration across Texas and beyond.

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Outcomes and Impact

The Austin SHINES program redefined what a utility can achieve through coordinated DER management.

- **Economic Performance:**
  - Validated the System LCOE to Serve Load metric, a new DOE-recognized approach that quantifies cost and reliability benefits across all DER types.
  - Demonstrated day-ahead arbitrage and real-time price dispatch capabilities, optimizing storage utilization and market participation.

- **Grid Reliability and Flexibility:**
  - Improved local voltage regulation, reduced feeder losses, and increased the amount of PV that can safely connect to the grid.
  - Demonstrated congestion management at the distribution level through coordinated ESS dispatch.

- **Customer and Community Benefits:**
  - Enabled commercial and residential customers to lower demand charges and participate in utility-hosted programs.
  - Empowered homeowners to integrate storage and EVs (V2G) into a utility-controlled environment that benefits all ratepayers.

- **Scalability and Industry Impact:**
  - Created a replicable DERMS architecture adaptable to any region or regulatory market.
  - Informed DOE's national framework for distributed-energy resource integration, with findings published in subsequent SETO and EPRI reports.

Why This Project Matters

The Austin SHINES initiative stands as one of the most comprehensive demonstrations of distributed-energy integration in the United States. By uniting solar, EVs, and smart inverters under an open-standard control system, Austin Energy and Doosan GridTech proved that high renewable penetration and reliable operations can coexist.

The project established a benchmark for how utilities can manage the transition to highly distributed, customer-centric grids, offering a scalable roadmap for cities pursuing carbon-neutral futures.

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