KSTAR
Powering the Future

KSTAR Case Study SPAIN

Powering Public Services: A 2.1 MWh Leap in Municipal Sustainability

with KSTAR BluePulse Energy Storage Solutions

www.kstar.eu

2025

Polideportivo Puente Castro

Project Background: The New Imperative for Municipal Energy Management

The modern municipality operates at the nexus of escalating challenges: climate urgency, fiscal pressure, and the public demand for reliable, essential services. The City of León perceived these not as isolated issues, but as symptoms of a centralized, brittle energy model. This project represents a fundamental strategic pivot—from passive energy consumer to active master of its own energy destiny. By deploying a coordinated network of twelve KSTAR storage systems, León is not merely installing hardware; it is architecting a new, decentralized energy infrastructure that embeds intelligence, resilience, and sustainability into the very fabric of its public services.

Project Scale: Architecting a Distributed Urban Power Plant

The scale of this deployment is its first profound statement. This is a conscious move beyond pilot projects to a systemic overhaul.

Collectively, these units form a "Virtual Power Plant" (VPP) for the municipality. This is not merely 12 individual batteries; it is a cohesive, distributed energy asset that can be orchestrated to provide city-wide load management, reduce peak demand charges at a systemic level, and enhance the stability of the local grid. This transforms the city's energy profile from a cost center into a strategically managed portfolio.

A Focus on Core Services: Powering What Matters Most

The systems were strategically placed in facilities that are essential to the city's daily function and quality of life:

- **Sports & Recreation Centers:** Ensuring community spaces have affordable power for evening events and activities.
- **Public Works Depots:** Providing reliable energy for the equipment and vehicles that maintain the city.
- **Administrative Hubs:** Guaranteeing that public services can continue without interruption.
- **Waste Management Facilities:** Powering operations like trash compactors cleanly and efficiently.

This approach ensures that the benefits of modern energy management directly support the most critical city services.

The KSTAR Solution: Engineering as an Enabler of Strategy

León selected the KSTAR BluePulse series for its technical merits, which enabled this strategic vision. The standardized "all-in-one" design—one BC197DE Battery Cabinet (197 kWh) and two KAC50DP Hybrid Inverters (100 kW) per site—was critical. This standardization was a key success factor, enabling rapid and consistent installation across twelve different locations with varying operational needs. And it turned strategic intent into operational reality with unparalleled efficiency and creating a maintainable, future-proof ecosystem.

Date:	November 2025
Location:	León, Spain
Partners:	Ayuntamiento de León, Norsol Energía Solar, Amara NZero
Technology:	KSTAR BluePulse Series
	(KAC50DP Inverter + BC197DE Battery Cabinet)
	G125KT7
Project Scale:	12 Systems
Total Storage:	1.97MWh
Total Inverter Power:	2.125 MW

CEAS Ventas Este

Analysis of Impact: Multi-Dimensional Value Creation

This initiative delivers value across three critical dimensions, creating a new paradigm for municipal operations:

Financial and Operational Resilience: The system intelligently shifts energy use, storing power during low-cost periods and deploying it during expensive peak demand. This transforms energy from a volatile expense into a managed asset, freeing up significant public funds for community programs instead of utility bills.

Uninterrupted Public Services: Beyond cost savings, the storage systems provide immediate backup power during outages. This ensures continuous operation of essential services—from waste management to administrative functions—strengthening public trust and maintaining service delivery even during grid instability.

Environmental Stewardship in Action: The project enables a tangible shift toward cleaner operations. At critical sites like waste management facilities, the system reduces reliance on diesel generators, cutting emissions and noise pollution while optimizing renewable energy use. This transforms necessary municipal operations into showcases of sustainable urban management.

Pabellón La Torre

Pabellón Luis Vives

CEAS Ventas Este

Nave Servicio de Limpieza

Palacio de Congresos

Pabellón Margarita Ramos

A Replicable Model for Modern Governance

The León energy storage initiative is a definitive case study in how municipal governments can leverage technology to meet modern challenges. It demonstrates that strategic investment in energy infrastructure is not merely an operational upgrade but a core function of responsible governance, directly contributing to financial health, service reliability, and environmental progress. By building a decentralized energy network, León has fundamentally enhanced its operational sovereignty.

As a KSTAR project engineer observed, "The León deployment validates a practical technical model for urban energy resilience. We've moved beyond theory to a working system that delivers measurable performance data on cost avoidance, backup power duration, and renewable self-consumption optimization. The real success is in the seamless integration across diverse facility types, proving this isn't a custom one-off, but a repeatable design for any city."

This project stands as a compelling blueprint for cities worldwide, proving that a proactive approach to energy management is essential for building the sustainable and resilient communities of the future.