Case Study – ATESS Hybrid Solar Solutions for Iraq's Energy Crisis

View over Slemani (Image Source:en.wikipedia.org)

Introduction

Iraq faces a severe and persistent electricity crisis. Frequent blackouts, soaring temperatures, and an over-reliance on expensive, polluting diesel generators cripple businesses and disrupt daily life. In 2025, Iraq will require approximately 54 GW of electricity to achieve power balance, while the current generation capacity stands at only 15 GW—indicating a substantial shortfall. During peak summer demand, this shortage becomes more severe, with many regions relying on small diesel generators to supplement the grid. This case study highlights how ATESS hybrid solar systems are providing a robust, sustainable, and cost-effective solution to these challenges. Through two typical cases in Slemani, we demonstrate how ATESS is helping Iraq to achieve energy independence, reduce operational expenses by up to 90%, and significantly lower their carbon footprint, paving the way for a more resilient and sustainable energy future in Iraq.

ATESS Hybrid Solar Systems: A Transformative Solution

ATESS hybrid solar energy storage systems combine the benefits of solar power generation with intelligent battery storage and grid connectivity to deliver superior performance and reliability:

HPS Series Hybrid Inverters: Our 30/50/100/120/150kW hybrid inverters are available in battery, load, grid and solar connection, which support small and medium commercial and industrial applications. Supporting up to 600 kW of system capacity.

PCS Series Battery Inverters : The PCS 100kW to 630kW battery inverters offer various options for businesses with high power demand. They apply to AC and DC coupling, off-grid, and hybrid scenarios.

High-Quality Lithium-ion Energy Storage Batteries System: Providing high energy density, long cycle life, and robust performance in challenging environmental conditions like high temperatures.

Smart Monitoring and Remote Management: Allowing real-time tracking of system performance, energy production, consumption, and remote troubleshooting, ensuring proactive maintenance and optimized operation.

ATESS has deployed advanced hybrid solar systems in Slemani, delivering tangible, sustainable benefits. Our solutions integrate solar PV, robust battery storage, and intelligent inverters to provide stable, clean, and cost-effective power.

In-depth Analysis of Key Cases

Key Case 1: Petra Petrol Station, **Slemani, Iraq**

System Configuration: A robust 100kW hybrid system with an ATESS HPS100 hybrid inverter, two BR75 storage battery racks (totaling 152kWh), and 64.4kWp solar PV system

Key Benefits & Impact:

Energy Independence and Cost Reduction

The Petra Petrol Station now operates with over 130,000kWh of clean electricity generated annually, covering all its operational needs. The integration of ATESS's hybrid inverter with high-capacity battery storage has resulted in a dramatic 85% to 90% reduction in energy costs, significantly lowering reliance on diesel generators and unstable grid power. This financial optimization leads to a rapid return on investment—typically within 2–3 years.

Uninterrupted Operations in an Unstable Grid

ATESS hybrid systems offer seamless power continuity, even during prolonged blackouts or erratic grid fluctuations—common in Iraq. With intelligent switching between solar, battery, and grid power, the Petra station experiences zero downtime, ensuring that fuel pumps, lighting, and electronic payment systems remain fully operational.

Daytime Solar Optimization and Nighttime Reliability

The hybrid system's design is perfectly aligned with the petrol station's energy consumption profile, which peaks during daylight hours. Excess solar energy is stored in the BR series battery racks and used after sunset, maintaining uninterrupted service through the night and eliminating energy waste.

Engineered for Harsh Environments

All system components—including the HPS inverter and BR battery racks—are built to perform in extreme temperatures from -25° C to 55° C, crucial for the hot summers and variable conditions of Slemani. This robust engineering reduces maintenance, ensures long-term reliability, and sustains optimal performance.

Key Case 2: Hotel in Slemani, Iraq

The Iraqi hospitality sector has long been mired in a persistent power crisis. Daily outages, exorbitant diesel generator costs, and environmental pressures severely impede hotel operational efficiency and guest experience. In a hotel in Kurdistan-Slemani, these challenges were particularly acute, rendering traditional power supply models unsustainable.

System Configuration: Leveraging its advanced energy storage technology, ATESS custom-designed an innovative solution for this hotel. We deployed a 250kW PCS250 battery inverter, a 138kWh BR138 battery rack, paired with a 120kWp Solar PV System. The core functions of this integrated solution are:

Stable Power Supply: By seamlessly integrating the unstable grid power, solar photovoltaic generation, and battery energy storage, the solution ensures continuous power availability for the hotel, even during grid outages. This eliminates the disruption of frequent blackouts, guaranteeing 24-hour operation of critical facilities such as air conditioning, lighting, elevators, and hotel parking.

Significant Reduction in Operational Costs: The system substantially decreases reliance on expensive diesel generators. By prioritizing the utilization of clean, free solar power and

optimizing peak-valley energy management strategies, it effectively slashes energy expenditures and enhances the hotel's profitability.

Enhanced Customer Experience: A consistently stable power environment significantly boosts guest satisfaction. The elimination of noise pollution from generators and the assurance of uninterrupted service quality, unaffected by power fluctuations, strengthen the hotel's market competitiveness.

Green and Environmental Image: Embracing renewable energy lowers carbon emissions, helping the hotel fulfill its corporate social responsibility. This establishes a green benchmark within the industry and facilitates compliance with increasingly stringent environmental regulations.

Through ATESS' energy storage solution, this hotel has not only resolved its core power challenges but has also achieved a win-win in sustainable operations and economic benefits.

Conclusion: Powering a Brighter Energy Future for Iraq

ATESS's successful deployment of hybrid solar energy storage systems across Iraq demonstrates a powerful solution to the country's energy challenges. By offering uninterrupted power, significant cost reductions, and substantial environmental benefits, ATESS empowers businesses to operate stably and sustainably. These projects serve as compelling testaments to the reliability, efficiency, and economic viability of ATESS's technology in demanding environments.

The ongoing energy crisis in Iraq and the broader Middle East region, coupled with a growing global impetus towards renewable energy, presents a vast market potential for hybrid solar energy storage solutions. Countries in the region are increasingly investing in sustainable energy to diversify their energy mix, enhance grid resilience, and reduce carbon emissions. The success of ATESS in Iraq provides a strong blueprint for expansion into similar markets facing analogous energy challenges.

As Iraq continues its journey towards a more diversified and sustainable energy landscape, ATESS stands ready to be a key partner in building a resilient and clean energy infrastructure for the nation.

Ready to transform your energy future? Visit atesspower.com today to learn how our energy solar solutions can benefit your business.