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As the global solar market matures, a new ally is transforming how we store and dispatch solar energy — **Battery Energy Storage Systems (BESS).** Once considered a luxury, BESS has become a necessity to ensure **round-the-clock power availability**, reduce curtailment losses, and deliver **uninterrupted energy during peak demand**. In 2025, it's clear: solar alone is no longer enough — storage is the game-changer.

BESS
in the Renewable Landscape

Based on analysis from BloombergNEF (BNEF), energy storage installations worldwide are projected to grow to 1,095 GW / 2,850 GWh while nearly all rise to 65% directly connected to renewable energy (i.e., solar and wind) by 2040. The U. S. alone added 8.7 GW of new battery storage capacity (a 55% year-on-year growth) in 2024.

The major driving forces behind new installations are:

- **Intermittency,** normally caused by cloudy weather overnight.
- **Grid instability,** typically in regions with high renewable penetration.
- **Energy pricing models** that encourage peak shifting via time-of-use pricing.
- **Opportunity for revenue** from the demand program and ancillary services.

Increased
Value with BESS

1. Peak Shaving and Demand Management

BESS enables solar developers and C&I customers to store energy and dispatch it during peak periods at night, and minimize their reliance on utility grid resources when the cost of the electricity is at its highest.

2. Grid Services and Frequency Regulation

Now that large-scale BESS systems can participate in the grid services market — providing utilities with frequency and voltage balancing, among other services, for improved resilience.

3. Energy Arbitrage

Store the cheap solar during the day. Sell it or use it when the prices spike. This model is being implemented by a number of microgrid operators and solar farms to maximize ROI.

Implementations

1. Clay Tye BESS – Essex, UK

- **Developer: Harmony Energy in partnership with Tesla**, with a capacity of 99 MW / 198 MWh.
- Provides balancing services for **National Grid ESO**, frequency regulation, and renewable energy storage in off-peak times.
- One of **Europe's biggest operational BESS projects**, relying on **Tesla's Autopilot software** to support automatically dispatchable energy.

2. Australia's Hornsdale Power Reserve (Tesla + Neoen)

- $150 million savings in grid costs in the first 3 years of operation.
- Coupled with wind and solar farms for enhancing grid stability.
- Established that BESS responds more rapidly than traditional gas peaking plants.

3. DEWA's 1.21 MWh Battery Storage Pilot with Tesla – Dubai

- **Location:** Mohammed bin Rashid Al Maktoum Solar Park (Phase 2)
- **System:** 1.21 MWh lithium-ion battery energy storage
- To test the capabilities of BESS to store solar energy for later use, notably for load shifting and to provide grid support.
- One of the first utility-scale battery storage pilot projects in the Gulf region.

The Economics of Solar + BESS

- IRENA indicates that the cost of battery storage has reduced on average of 89% since 2010.
- With the appropriate regulatory framework, BESS with solar may raise the IRR of the project by 20-30%.
- PPAs have evolved to include "dispatchable renewables" language that demonstrates a positive value associated with the pricing of solar+BESS above the normal solar price for RFPs.

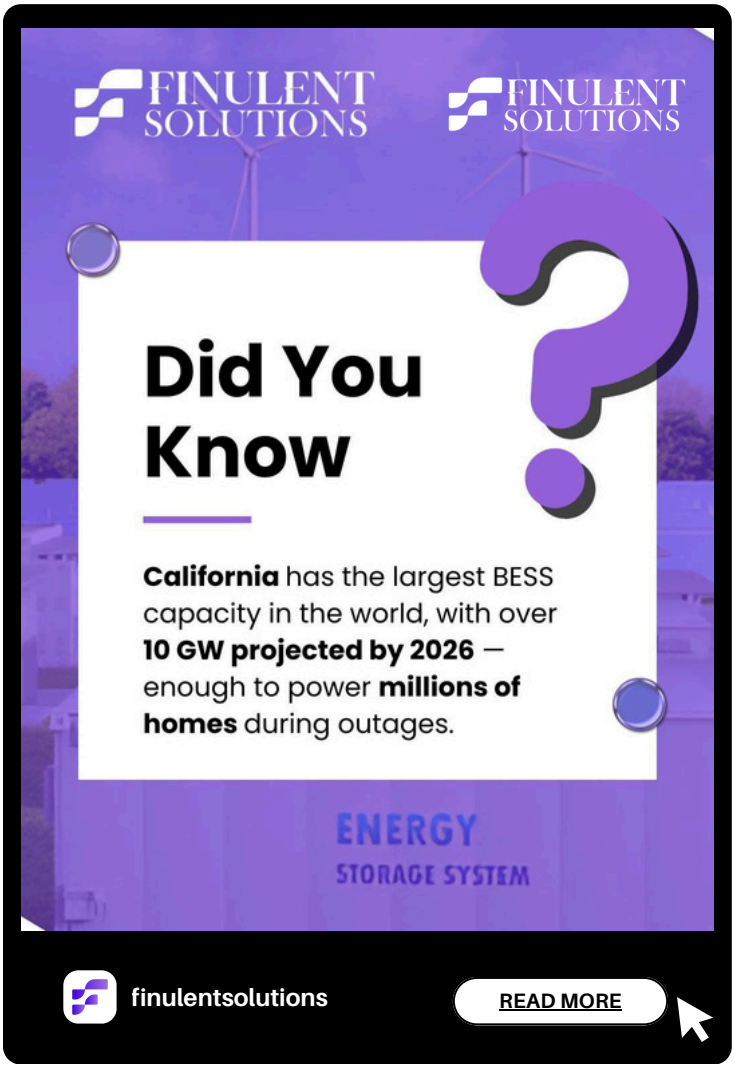
The Future of BESS

- **Time constraints**: According to California's SB 100, the goal of 100% clean power is targeted for 2045 with the importance of the BESS in achieving this outcome.
- **Incentives & subsidies**: The U.S. Inflation Reduction Act (IRA) allows for a 30% tax credit for stand-alone storage projects.
- **Corporate commitments**: Companies such as Amazon and Google will be striving to achieve 24x7 born renewable energy and exploring integrating the BESS solutions to reach their goals.

Solar has won the price war, and now BESS is winning the reliability war. With more grid intelligence and a demand for clean energy 24/7, BESS is becoming the essential complement to solar — the tool for peak power delivery, the enabler of zero downtime, and the resilient edge we need for a clean energy future.

Whether you are a developer, a utility or someone who runs a business — the question is not whether you should store, but how soon.

FINUSHOTS



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