

Battery Energy Storage Systems: Five Priorities Shaping Energy Storage Manufacturing



Scaling battery energy storage has become as much a manufacturing challenge as a technology challenge.

Manufacturers must successfully navigate supply chain complexity, accelerate product development, improve product reliability, scale production effectively, and adapt to evolving regulations all while maintaining cost competitiveness.

The companies leading the next phase of BESS growth are designing manufacturing strategies that support global scalability, regional flexibility, quality, and long-term reliability from the start.

1 - Regional Manufacturing is Becoming a Competitive Advantage

Energy storage demand is growing across North America, Europe, and Asia, but products, regulations, and customer requirements don't look the same in every region. BESS manufacturers are prioritizing engineering and manufacturing partners that can support regional programs while maintaining consistent quality across global deployments.

Having engineering, sourcing, and production teams closer to customers can accelerate design iterations, streamline qualification, and reduce production delays that often come with managing complex international supply chains.

Strategic considerations:

- Can your manufacturing strategy adapt to regional market requirements while maintaining operational efficiency and consistency?
- Are engineering and production teams aligned throughout from initial design development through volume production?
- Do you have access to manufacturing capabilities and capacity where your customers are deploying systems?

2 - Supply Chain Resilience is Redefining Supplier Relationships

For battery energy storage manufacturers, supply chain strategy is no longer just about lowering cost and improving lead times. Shifting trade policies, local content requirements, incentive programs, and evolving regulations can all influence where products are built and how quickly projects move forward.

Manufacturers are turning to suppliers that can support production across multiple regions, provide engineering support early in development, and scale alongside growing demand. The goal isn't just securing supply. It's maintaining flexibility as market conditions continue to change.

Strategic considerations:

- Can key suppliers support volume production across multiple regions?
- How quickly can your supply chain respond to regulatory or market changes?
- Are suppliers helping identify manufacturability challenges early in development?
- Can your suppliers scale alongside demand while maintaining quality, delivery schedule, and supply continuity?

3 - Production Readiness is Moving Earlier in Development

Moving from prototype to volume production remains one of the biggest challenges in energy storage manufacturing. Early prototypes often validate system performance, but scaling those designs for efficient production presents a different set of challenges.

Manufacturers are addressing manufacturability earlier in development by evaluating automation opportunities, material selection, assembly processes, and supplier capacity before production ramps. Addressing manufacturing constraints early helps reduce redesigns and minimize cost, and mitigate production schedule changes.

Strategic considerations:

- Have manufacturing requirements been considered during product development?
- Can production capacity expand without creating new quality, cost, or delivery risks?
- How and where can automation improve consistency and throughput?
- Are suppliers prepared to support future volume growth?

4 - Thermal Management is Expanding Beyond Cooling Performance

Battery thermal management has become a broader system level design challenge. Choosing a thermal management solution requires looking beyond thermal conductivity alone. Interface geometry, packaging constraints, manufacturing requirements, and target performance all factor into the thermal solution selection. Thermal propagation protection is also becoming an important consideration, requiring solutions that help slow the transfer of heat between cells, modules, and other critical areas.

Effective thermal strategies balance performance, protection, manufacturability, and cost across the system.

Strategic considerations:

- Does your thermal strategy address performance and propagation protection?
- Have thermal propagation risks been evaluated early in the development cycle?
- Are thermal materials optimized for manufacturing and long-term reliability?

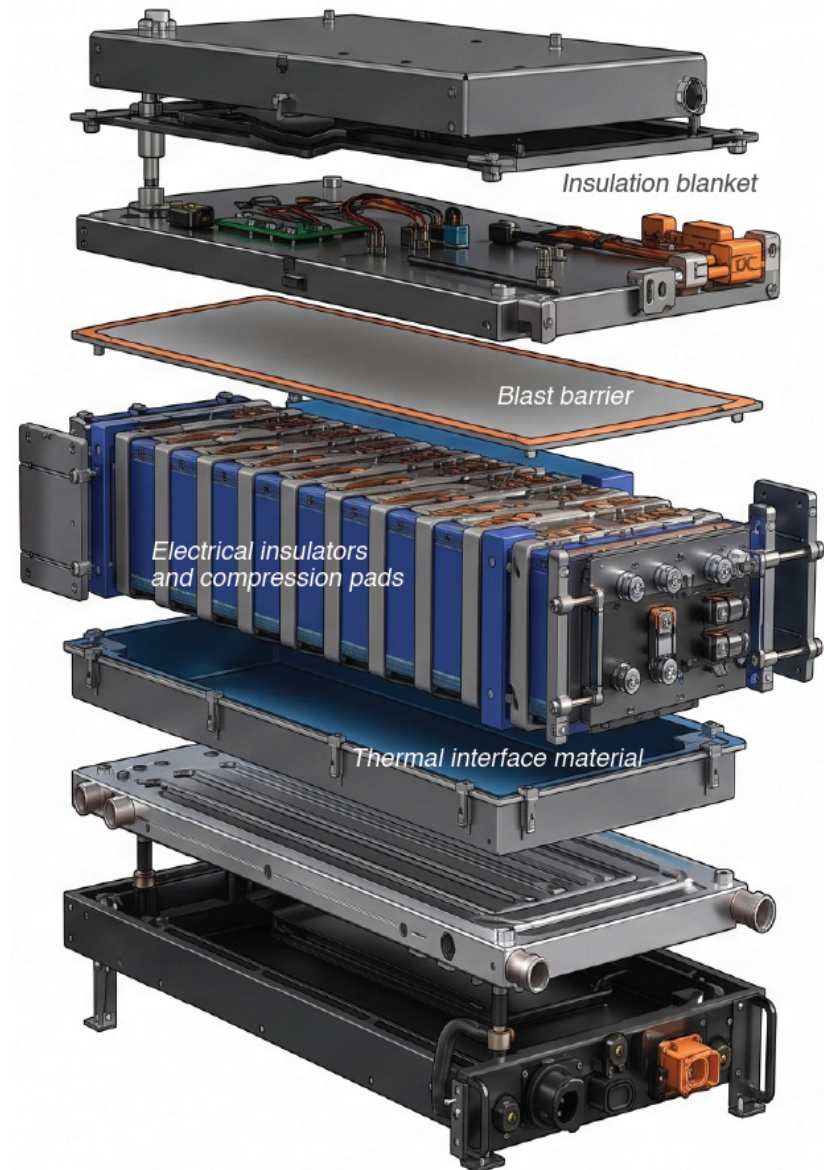
5 - System Reliability Is Becoming a Key Design Priority

Long-term reliability is becoming an important consideration alongside performance, cost, and safety. Manufacturers are looking beyond meeting initial design requirements and placing greater focus on how consistently the design can be built, validated, and supported throughout its lifecycle.

This drives more attention to design validation, testing, manufacturability, and process control early in development. Decisions made during product design influence production efficiency, product quality, and field performance long after a system is deployed. Manufacturers are looking for engineering and manufacturing partners that can identify risks early, validate designs, and support a smooth transition from prototype to high-volume production.

Strategic considerations:

- Can quality and performance be maintained as production scales?
- Does your validation strategy reflect real-world operating conditions?
- Are suppliers equipped to support consistent manufacturing across regions and programs?



Engineered Materials Across the BESS Assembly

The next phase of energy storage growth will depend on more than battery technology alone. Manufacturers that can scale production efficiently, adapt to regional market requirements, strengthen supply chain resilience, and build safety into every stage of development will be better positioned to compete as deployments continue to accelerate.

The most successful BESS programs are built with production in mind from the beginning. Early decisions around materials, manufacturability, supplier strategy, and safety can influence everything from product reliability to long-term scalability.

Accelerating BESS Manufacturing with Boyd

Boyd helps energy storage manufacturers move from concept to production with engineering expertise, advanced material technologies, and global scalable manufacturing capabilities.

From early-stage design support and rapid prototyping to validation testing and high-volume production, Boyd works alongside customers to help solve complex thermal management, battery safety, sealing, protection, and manufacturability challenges. Our engineers collaborate early in development to identify scalable solutions that support performance, reliability, and production readiness.

With global manufacturing operations, rigorous quality systems, and in-house testing capabilities, Boyd helps customers accelerate qualification, reduce development risk, and confidently scale production as programs grow. Whether supporting a new battery platform or expanding manufacturing capacity across regions, Boyd provides the technical expertise and operational scale needed to bring innovative energy storage solutions to market.

To learn more, visit us at www.boydcorp.com.

Scale with Boyd

Engineering support

Rapid prototyping

In-house testing & validation

Material selection & converting expertise

Design for manufacturability (DFM)

Global manufacturing sites

Low-to-high-volume production

Robust quality systems

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