

CASE STUDY

From Complexity to Certainty: Accelerating Global Energy Storage Deployment

How Engineering, Procurement, and Construction (EPC) excellence and collaboration are driving faster, more reliable project delivery

The Situation

Battery-based energy storage has become indispensable to modern power systems. It is the key to unlocking the full potential of renewables, strengthening grid reliability during peak demand, and providing the controllability that grid operators increasingly require. However, as the role of storage has grown, so has project complexity.

Today's projects are asked to do more than ever—operate within sophisticated hybrid power plants, participate in stringent ancillary service markets, and, in some regions, provide advanced grid-forming capabilities that are fundamental to system stability. These capabilities bring tangible technical and operational challenges, from navigating regulatory hurdles to integrating with legacy infrastructure and managing complex commissioning requirements.

Beyond technical delivery, developers now face growing expectations from local councils, communities, and landowners who want battery projects to deliver tangible benefits within their regions. Meeting social license

obligations and community expectations has become as critical to project success as meeting offtake commitments and performance guarantees.

For utilities and developers, any delay in this intricate process translates directly into lost revenue, a failure to meet offtaker obligations, and exposure to significant market penalties. In this high-stakes environment, deployment speed and execution certainty are no longer just advantages; they are critical differentiators. Success depends on meticulous delivery, and customers need a partner who can navigate the full spectrum of risk to turn ambitious plans into operational success.

The Challenge

Energy storage projects are sophisticated undertakings. Even with strong market demand and clear project value, the path from planning to operation requires precision and coordination across many fronts. The five areas where challenges most often arise are:

1. Permitting and Interconnection

Obtaining permits and grid interconnection approvals is essential to bringing storage projects online. These steps involve multiple authorities and technical reviews to ensure safety, compliance, and system compatibility. While vital, they can be time-consuming if not managed proactively. Building strong relationships with local permitting authorities and fire services, preparing robust technical documentation, and engaging with communities early all help reduce uncertainty and accelerate timelines.

2. Financing

Securing financing is another critical milestone. Educating financial institutions and insurers about energy storage as a reliable, long-term investment is key to unlocking capital. Developers should also consider the financial strength of project partners, reliance on Tier 1 suppliers, and proven safety and performance track records—all of which build investor confidence and support successful delivery.

3. Supply Chain and Construction Logistics

Energy storage projects depend on the delivery and installation of large, high-value equipment, often at remote or technically complex sites. Coordinating this requires meticulous planning to prevent bottlenecks and ensure site readiness. Working with an experienced engineering, procurement, and construction (EPC) partner provides a single point of contact to manage multiple contractors and suppliers efficiently, reducing complexity and maintaining alignment across all parties. Managing international logistics adds another layer of coordination, as equipment is often

sourced from multiple regions. Careful scheduling, clear communication, and proactive risk management are essential to avoid delays, while embedding high safety standards from the start protects workers, strengthens community trust, and keeps projects on track.

4. Commissioning and Integration

Commissioning brings all system components together to validate performance and grid compatibility. This phase demands close collaboration among developers, utilities, and technology providers to meet both contractual and operational requirements. A deep understanding of grid operator expectations, especially around testing protocols, scheduling, and deliverables, is essential. This becomes even more complex for advanced applications such as grid-forming systems or in markets with evolving grid codes, where misalignment can risk delays or penalties. Clear workflows, strong technical expertise, and disciplined processes are key to navigating these requirements while maintaining the highest standards of safety and reliability.

5. Ensuring Long-Term Availability

Once systems are operational, maintaining high availability becomes the next major challenge. Sustained performance depends on proactive maintenance, reliable service, and rapid issue response. Local service teams play a vital role at this stage, providing on-the-ground expertise, leveraging data-driven monitoring, and coordinating maintenance to prevent downtime. Their ongoing support enables storage systems to continue to operate safely, efficiently, and in line with performance guarantees long after commissioning.



The Solution

Fluence provides the deployment expertise that translates into speed, certainty, and long-term operational success. This history of execution, beginning with the world's first grid-connected lithium-ion battery system in 2008, has given us unmatched insight into anticipating risks, adapting to regional conditions, and executing at scale. Our approach is built on core pillars designed to de-risk projects from start to finish and safeguard customer returns by minimizing lost revenue and contractual exposure.

Global Experience, Local Expertise

With thousands of megawatt-hours of energy storage deployed across nearly 50 markets, Fluence possesses an unmatched institutional knowledge of regional permitting norms, interconnection processes, and construction practices. Our teams are embedded locally, fostering trusted relationships with utilities, regulators, and communities that help projects move smoothly from concept to commercial operation. This localized expertise enables faster response times, smoother handoffs, and optimized project delivery, reducing delays that could otherwise impact market participation or offtaker obligations.

Integrated EPC Capabilities and Partnership

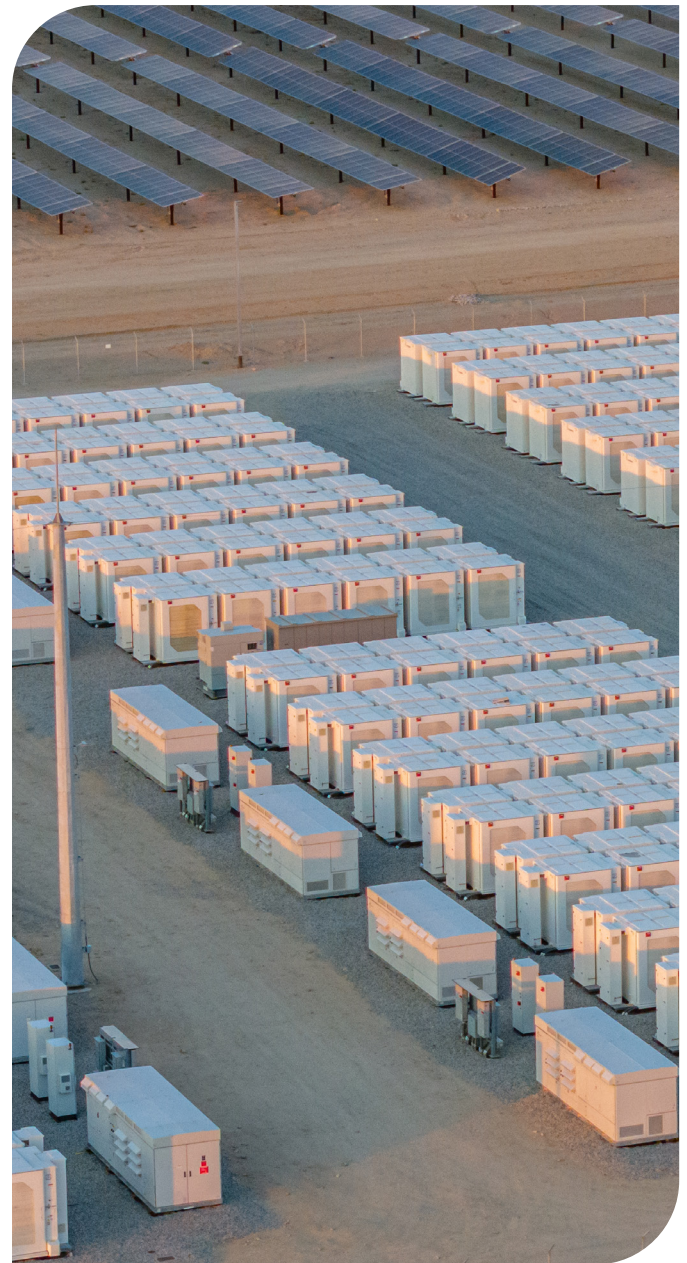
Whether acting as the full EPC provider or as just a core technology supplier, Fluence's hands-on experience strengthens every project. Our in-house EPC and project management teams give us direct control to recover time lost to external issues, whether by expediting equipment delivery, resequencing installation plans, or coordinating auxiliary systems. This DNA in engineering, procurement, safety, and community engagement allows us to anticipate problems and guide customers through them effectively, helping to ensure a seamless delivery process.

Front-End Engineering and Design (FEED) and Early Work Agreements (EWAs)

To accelerate project readiness, Fluence offers FEED services in select markets and similar Early Work Agreements (EWAs) in others. These pre-Notice to Proceed (NTP) activities enable early site development, refined engineering, and preparation for long-lead procurement. By addressing key design and logistical considerations upfront, FEED and EWA programs reduce time from NTP to commercial operation, improve schedule certainty, and help customers capture earlier revenue streams.

A Foundation of Safety and Risk Management

Safety is central to our identity and our project execution strategy. From full-scale UL 9540A fire testing to ensuring NFPA 855 (2026) compliance and conducting local firefighter training sessions, Fluence has built a global reputation for delivering safe, reliable projects. This unwavering focus not only protects people and assets but also accelerates permitting approvals by earning regulator and community confidence from day one.



The Results: Case Studies in Deployment Excellence

United States



In Arizona, Ørsted selected Fluence as the technology and EPC provider for the 300 MW / 1200 MWh battery system at the Eleven Mile Solar Center—the state's largest co-located solar-plus-storage facility. The system delivers critical evening peak power for Salt River Project (SRP) and supports the Meta Mesa data center through a long-term PPA. As the full turnkey EPC provider, Fluence maintained direct control over installation progress and key decisions, enabling proactive management of schedule-critical activities. This flexibility allowed the team to accelerate and resequence installation work to recover time lost to challenges such as auxiliary power needs and delivery delays for a key piece of equipment. The team also fast-tracked commissioning, ultimately handing the site over to the customer two weeks ahead of schedule. Despite the size and complexity of the project, the system achieved substantial completion on time in May 2024. Following installation, Fluence continues to support the project's long-term success. Around-the-clock remote monitoring and advanced analytics from its network operations center help ensure the system performs optimally, maximizing uptime and revenue generation for years to come. Today, Eleven Mile stands

as a strong example of coordinated hybrid deployment and dependable execution under a single technology and EPC provider.

In Indiana, AES Indiana partnered with Fluence to develop the 200 MW / 800 MWh Pike County Battery Energy Storage System (BESS) in Indiana. The facility is strategically located on the site of a retired coal plant, now co-located with both solar and natural gas plants, allowing the project to leverage the site's valuable, existing interconnection rights. This reuse of infrastructure minimized environmental impact and significantly accelerated the deployment timeline. Fluence's full turnkey delivery expertise was central to overcoming the project's complexity. This included navigating the Midcontinent Independent System Operator (MISO) market requirements and managing extensive documentation for fire safety (NFPA 855), hazard mitigation planning, and emergency response coordination. The Pike County BESS now stands as a strong example of how strategic site reuse and comprehensive project management can enable the efficient deployment of large-scale energy storage.

Europe



In September 2025, amidst wartime conditions, DTEK and Fluence energized Ukraine's largest energy storage portfolio—200 MW / 400 MWh across six sites. Driven by the urgent need for grid stability ahead of winter, the entire portfolio was constructed and commissioned in less than six months. With travel severely restricted, Fluence pioneered a fully remote commissioning model. The team provided advanced, hands-on training to 20 Ukrainian engineers at Fluence project sites in Europe, empowering them to lead all on-the-ground installation and commissioning. This landmark project provides a vital power buffer for 600,000 homes, decentralizes the nation's grid, and marks a historic step toward Ukraine's long-term energy security.

“With our partner Fluence, we are fast-tracking innovation, building homegrown technical expertise, and demonstrating that even in wartime, progress is achievable. This battery storage facility is proof of our determination to build back stronger. Together, we are taking an important step toward a more secure and resilient energy system for Ukraine.”

Maxim Timchenko
DTEK CEO



Australia



In Victoria, Tilt Renewables selected Fluence for the 100 MW / 200 MWh Latrobe Valley BESS under an EPC wrap and supported by a long-term services agreement. The project required deep expertise to navigate Australia's stringent grid connection process, overseen by the Australian Energy Market Operator (AEMO). Fluence's team managed the entire process—from developing sophisticated PSSe and PSCAD software models that simulate system behavior, to leading both the R1 Registration (pre-construction design validation) and R2 Commissioning (post-construction performance testing). This approach ensured full compliance and smooth integration into the National Electricity Market (NEM), allowing the system to begin generating revenue ahead of contractual completion. The project became the first globally to deploy Fluence's full integrated ecosystem: Gridstack™ hardware, the OS7 operating system, Mosaic™ AI-enabled bidding software, and the Nispera™ asset performance management platform.

In New South Wales, Fluence is delivering a landmark 500 MW / 1 GWh system for AGL at the site of the retired Liddell coal station, under an EPC wrap and supported by a long-term services agreement. This project highlights leadership in grid-forming technology, critical for maintaining grid stability. Unlike conventional grid-following systems that respond to the grid's rhythm, grid-forming technology enables the battery to establish its own "heartbeat" of voltage and frequency, providing essential strength and inertia as thermal assets retire. Recognizing the heightened complexity, Fluence's specialist team is providing comprehensive engineering support throughout the grid connection process to validate these advanced capabilities, delivering a next-generation asset fundamental to the future reliability of Australia's energy market.



Conclusion

The promise of energy storage is clear: cleaner power, stronger grids, and a more resilient energy future. Delivering that promise at scale requires not only advanced technology but also the expertise to manage complexity with speed and certainty. Whether serving as an EPC contractor or a technology partner, Fluence empowers customers to overcome complexity, reduce risk, and achieve operational excellence.

Ready to accelerate your next project?

Contact the Fluence team to learn how our deployment expertise and proven track record can help you deliver on time, on budget, and at scale.



Fluence Energy, Inc. (Nasdaq: FLNC) is a global market leader delivering intelligent energy storage and optimization software for renewables and storage. Our solutions and operational services are helping to create a more resilient grid and unlock the full potential of renewable portfolios. With gigawatts of projects successfully contracted, deployed, and under management across nearly 50 markets, we are transforming the way we power our world for a more sustainable future.

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