KEYNOTE INTERVIEW

At the engine room of Europe's energy sovereignty

As the region's decarbonisation and energy sovereignty strategy gathers pace, could battery storage be the next critical piece of the energy puzzle, asks InfraVia's Athanasios Zoulovits and GIGA Storage's Kevin Dijkers

Europe's energy landscape is undergoing the most profound transformation in decades.

As the continent shifts away from a reliance on fossil-fuelled, baseload energy sources towards decarbonised power sources and greater energy independence through an increased share of domestically generated renewables, the need for flexibility, stability and resilience within the energy system has become paramount.

Renewable energy from wind farms and solar plants are playing an increasingly pivotal role within the power system, yet their inherent variability has exposed structural weaknesses in grids that were never designed for such intermittency.

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Against this backdrop, battery energy storage systems have emerged as essential – not optional.

Athanasios Zoulovits, partner at InfraVia, and Kevin Dijkers, CEO of portfolio company GIGA Storage, discuss how storage has moved from a 'nice to have' to a necessity, the evolving regulatory landscape and what it takes to build a resilient, investable storage platform in Europe.

Q Why is battery energy storage now considered core critical infrastructure in Europe?

Kevin Dijkers: At its heart, the answer comes down to four pillars: strategic independence, affordable electricity, system reliability and multifunctionality. Europe is moving away from a model based on controllable, fossil-fuelled generation towards one relying more on domestic renewable power, which is great as it's clean and increasingly cheap.

However, renewables mean a more volatile, more congested and more expensive to operate system. This is why a flexibility layer is required. Batteries

How can the industry manage supply chain and technology risk?

KD: The technological risks associated with batteries are, in truth, relatively low as lithium-ion remains a proven and bankable technology. The real challenges stem from the supply chain, rather than the underlying core technology.

It is essential to partner with tier-one suppliers with proven sustainable supply chains with robust balance sheets and established track records. Here, contract diligence and on-site follow up are paramount – warranties, degradation curves and performance guarantees must be watertight, leaving little room for uncertainty. In addition, during the construction and operational phase, owner oversight and presence can ensure focus and early warning to accelerate problem solving.

Diversifying suppliers and integrating software and control systems properly are equally critical. These assets

must perform for more than 20 years, making execution and partner selection crucial. Ultimately, the main risks lie more in execution, integration quality, and supplier selection than in the core technology itself.

are the Swiss Army knife of the energy system: they balance the grid, absorb excess solar and wind, shift energy from sunny middays to evening peaks, relieve congestion and even support the system to avert blackout scenarios.

That's why storage is no longer a luxury – it's critical infrastructure.

Athanasios Zoulovits: If you look at Spain, you'll see the perfect illustration of this. The April 2025 blackout wasn't caused by renewables but by a lack of investment in the supporting infrastructure – exactly the service batteries provide. At the same time, Spain consistently enjoys some of the lowest wholesale prices in Europe precisely because it invested heavily in renewables.

However, cheap, clean power alone isn't enough. You need resilience, the ability to manage intermittency, avoid bottlenecks and provide ancillary services. Batteries are uniquely capable of doing all of this.

In the early days, people saw storage as purely a trading asset. Those days are now gone. System operators today have experienced the impact, positive and negative, that storage can have. They want batteries to support system stability, not chase short-term arbitrage, and we agree.

The long-term opportunity lies in operating batteries as true infrastructure: reliable, predictable and aligned with the needs of the electricity system – while delivering predictable returns to investors.

What role does regulation play in the sector?

KD: Every major institution – the European Commission, the IEA, ENTSO-E – recognises storage as a key enabler of flexibility and system stability. But on the ground, regulation is still very fragmented.

Some regions treat storage like generation, others like infrastructure. And grid fees differ widely. Balancing markets operate under different rules and capacity mechanisms exist in the UK and Belgium but are emerging slowly elsewhere.

The direction of travel is positive and supportive. We see progress on double charging, on more robust system services markets and on clarifying access and remuneration mechanisms. But we're not there yet, so local expertise is essential. There's temporary uncertainty but also opportunities for long-term players who can navigate all the complexity.

AZ: Regulation has evolved. In the beginning, it was limited – almost non-existent for storage. Now, as storage becomes critical to keeping the lights on, regulation is starting to catch up. But it's not harmonised. Europe has an overarching framework, yet each country still applies it differently.

We see regulatory evolution everywhere: reforms on grid charge, capacity mechanisms, permitting rules and technical requirements. These changes increase complexity and raise barriers to entry on development as well as operations. Unlike solar or wind, where 30 years of experience have rendered development risk more predictable, batteries require developers to adjust constantly to an evolving grid system that sees you as part of critical infrastructure.

To operate effectively, you need the scale, expertise and technical capability to stay aligned with regulators and system operators. That's a fundamentally different business model from traditional renewables.

Q Which geographies in Europe are most attractive for storage?

AZ: From a high-level perspective, attractive markets share a few characteristics: a liberalised electricity market with high liquidity, high renewable penetration (usually above 30 percent of installed capacity), grid congestion and volatility on the intraday power markets. Based on those criteria, the frontrunners today are the Netherlands, Belgium, Germany and the UK.

The Netherlands and Belgium have intense grid congestion and rapid solar and wind (mainly offshore) growth. Germany has massive renewable expansion and increasing constraints. While the UK is a mature market with deep liquidity and revenue visibility through its capacity market – but still far behind on deployment of BESS compared with the operator's ambitions to maintain system stability.

Beyond these, emerging opportunities exist in Spain, parts of Scandinavia and other nascent markets. But you need to be careful, oversupply can happen quickly – as we're seeing, to some extent, in Italy.

KD: From GIGA's standpoint, the Netherlands, Belgium and Germany remain core. These countries have structural grid problems that batteries can actively solve. That's where our expertise adds the most value.

The biggest constraint isn't demand, it's grid access and regulatory clarity. Execution speed matters enormously. Once we gained experience in the Netherlands, expanding into Germany was the logical next step.

Q How would you describe the revenue model for battery energy storage, and how can managers deliver infrastructure-like returns?

AZ: The beauty of BESS is that the revenue stack is inherently modular, and the route to market diverse. As the market is entering a more established phase, you can dial up or down your merchant exposure.

The most attractive risk return profile on the revenue model that fits with our investment philosophy blends both routes to market. To achieve that we tranche the utility scale projects developed by our portfolio companies into sub-modules from a revenue standpoint.

You protect your downside with contracted tolling revenues for a big part of the capacity. But you preserve merchant revenue upside by contracting with multiple experienced optimisers (utilities and trading houses) who work in parallel and compete on different sub-modules to deliver optimal gross revenue to the BESS owner.

And to deliver the expected return, operational excellence is crucial.

KD: The key is balancing stability and flexibility. You need some contracted revenues for predictability, but you also need exposure to merchant markets to capture upside from market volatility.

A typical revenue stack includes frequency and balancing services, intraday and day-ahead trading, congestion relief services and capacity market revenues.

We often split large utility-scale projects into blocks. Some parts are contracted over the long term, such as tolling arrangements with utilities, and other parts managed by optimisers to capture market upside. This approach balances risk and return.

There's also been a movement toward virtual or financial tolling structures, which helps anchor long-term revenues while keeping flexibility for future market developments.

In summary, in order to deliver infrastructure-like returns with battery energy storage, a disciplined approach is required that blends contracted and merchant exposure, diversifies across markets and revenue streams, and consistently prioritises operational excellence.

Q What are the key success factors for profitable development and operations?

KD: Firstly, it's all about discipline in development and quality over quantity. Securing the right grid connection on time for COD is the single most important factor as location determines everything – access to revenue streams, congestion value and system service value. Secondly, partnering with top-tier suppliers is essential, underpinned by rigorous contract negotiation. Thirdly, operational excellence must be at the core of the strategy. While many players stop at development, energy storage demands a far greater degree of sophistication than traditional solar or wind. Success hinges on managing multiple stakeholders, sophisticated software and complex revenue strategies. I believe it's operational skills, not merely development capabilities, that distinguish leading firms in this sector.

AZ: I completely agree, this is not a land-grab game. Blocking hundreds of grid positions has limited value if you can't develop, finance, build and operate them at scale.

Success comes from end-to-end excellence, selecting the right projects, structuring bankable contracts, building at utility scale, operating assets to the highest standard and securing the best revenue stack over the long term. The investment in people and processes to deliver operational readiness, management of multiple routes to market alongside the scale of capital committed suggest that it's about delivering top-quality execution at every step of the process. This, ultimately, comes down to the quality of people in the company and clear leadership, as with every successful company.

Crucially, we shouldn't lose sight of the broader mission which is decarbonisation and European energy sovereignty. Within that objective, batteries are essential to delivering clean, affordable, continuous power – which is exactly what Europe needs to thrive. ■

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