a.s.r. real assets investment partners

Why battery storage is a robust addition to institutional investment portfolios

In this thematic paper, a.s.r. real assets investment partners demonstrates how investing in energy storage - and in particular battery energy storage - contributes to a more resilient investment portfolio. The combination of stable long term income, a lower risk profile, and additional upside potential makes battery storage an attractive addition to an investment portfolio. Infrastructure furthermore enhances diversification within the overall investment portfolio, making it all the more compelling to allocate capital to this segment. According to a.s.r. real assets investment partners, an active allocation to battery storage is therefore strongly worth considering for institutional investors.

A framework based on megatrends and fundamental insights

Using a framework built around megatrends, a fundamental investment view and valuation expectations, a.s.r. real assets investment partners develops the structure of real assets investment portfolios. This framework highlights the various investment opportunities within the energy transition and shows how these contribute to diversification and stability within an institutional investment portfolio.

Four dominant megatrends for the coming decades

The first step in the framework are the megatrends. Megatrends are key themes that influence real assets investment portfolios. a.s.r. real assets investment partners identifies four megatrends that will be decisive for investors in the years ahead, namely:

Demographic developments

Climate change

Digitalisation

Economic transformation

Energy transition as the main theme within new deal flow

a.s.r. real assets investment partners observes that the majority of new infrastructure deal flow continues to focus on the energy transition. This is not surprising, as the task of transforming the economy into a low carbon system is immense. Bloomberg estimates that more than five trillion euros per year will be required to achieve net zero by 2050, as stipulated in the Paris Climate Agreement.

The energy transition aligns with several of the megatrends mentioned earlier. Both demographic developments and digitalisation are driving increased demand for energy. From a climate perspective, it is essential that this energy is generated sustainably. The geopolitical landscape has also changed significantly in recent years, influenced by Russia's invasion of Ukraine in 2022, the re election of Donald Trump in 2024, and the growing economic influence of China. These geopolitical and economic shifts have heightened the global importance of energy independence.

Energy transition and the increasing pressure on electricity grids

The importance of inertia for a stable electricity grid

At the end of April 2025, a large part of Spain and Portugal was affected by a major power outage that disrupted vital infrastructure and impacted millions of people. A series of short fluctuations in the network frequency triggered a snowball effect, causing the electricity grid in several regions to shut down automatically. These frequency fluctuations can occur when there is an imbalance between supply and demand. To ensure stability on the supply side, so called inertia is required: the system's ability to absorb and dampen changes in grid frequency.

This inertia is normally provided by traditional power plants, whose rotating mechanical components function like a flywheel and thus contribute to system stability. In recent years, Spain has invested heavily in renewable energy generation such as solar and wind, while rapidly phasing out fossil fuel power plants. This development has led to a reduction in system inertia, potentially making the electricity grid less stable.

Electricity demand is rising sharply – driven by AI and electrification

Global electricity demand is expected to increase significantly in the coming years. After two decades of relatively stable demand, the International Energy Agency now anticipates an annual growth of more than 4% in electricity demand. This acceleration is driven by several factors, including global economic expansion, the continued electrification of transport, growing demand for both heating and cooling, industrial applications, and the rapid growth of data centres. Artificial intelligence has emerged as the most recent and most significant new driver of electricity consumption.

The growing demand for energy and the accelerating energy transition bring several challenges. The large scale power outage in Spain and Portugal illustrates how multiple challenges intersect within the energy transition:

- Decarbonising energy supply – expanding renewable generation to replace fossil fuel production.
- Enhancing grid robustness – strengthening and modernising existing networks to meet rising demand and improve system stability.
- Energy market regulation – creating a policy and regulatory framework that enables governments to facilitate private capital.

Private opportunities in network infrastructure

This thematic view centres on the robustness - strengthening and stabilization - of the electricity grid. Upgrading the networks requires more than capital investment alone: an appropriate regulatory environment is also essential to enable private investors to participate. Technological innovation plays an increasingly important role in this context.

High voltage networks in many developed countries require significant reinforcement. In Europe, the majority of these networks are publicly owned but in some cases, private investors can have the opportunity to participate. For example, in September 2025, it was announced that TenneT had sold its stake in TenneT Germany to three major institutional investors.

Investing in physical networks is therefore possible for infrastructure investors. Sometimes this occurs through large scale transactions, but more frequently through local networks – energy infrastructure projects built specifically for residential areas, industrial zones, or business parks. These projects often integrate energy generation, storage, and distribution. Such initiatives align with (government) policy aimed at increasing energy autonomy and are closely linked to the megatrend of economic transformation.

Technology as an accelerator of grid optimisation

Technological solutions are increasingly being used to optimise existing electricity networks. With relatively small interventions, it is possible to create additional capacity. AI applications, which help respond intelligently to grid imbalances, can play an important role in this process. The continued rollout of smart meters also provides attractive investment opportunities for investors.

Why battery storage is central to the investment potential

For a.s.r. real assets investment partners, the most compelling segment for supporting the electricity grid is the use of batteries and battery storage systems, also known as BESS (Battery Energy Storage Systems). BESS can be deployed in several ways. The most common application is co-locating batteries next to renewable energy generation - often solar power - to store generated electricity for later use. This allows short term fluctuations in supply and demand to be absorbed. The current generation of batteries can store energy that can be used for up to four hours, which is sufficient for this purpose.

The revenue model typically consists of a combination of contracted baseload capacity and trading on the balancing market. a.s.r. real assets investment partners observes that projects using this combination achieve better PPA terms than projects based solely on solar energy.

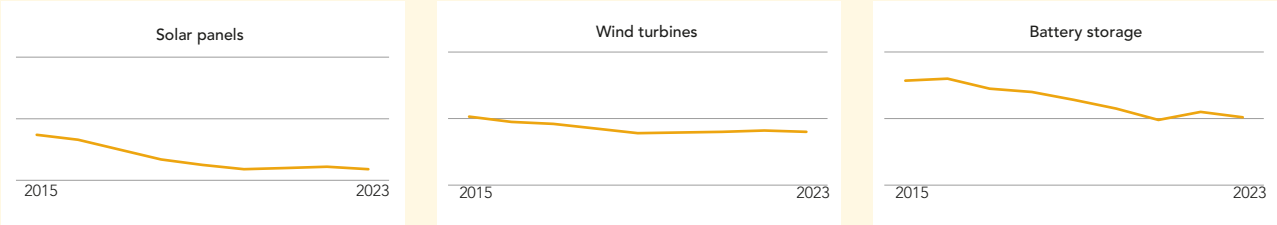
In addition, the number of standalone battery solutions designed to stabilise major transmission connections is increasing rapidly. In Germany, for example, low cost electricity is generated in the north - primarily from offshore wind - while demand is concentrated in the south, where renewable generation is more expensive. As a result, battery storage projects are being installed along these north south corridors to safeguard the stability of these critical transmission lines. Investors enter into long term agreements with energy companies, which can use the available battery capacity at their discretion. Such agreements are known as tolling agreements.

Regulation: the United Kingdom as a reference market

Governments in various countries are drawing lessons from the large scale power outage in Spain and Portugal (2025) and are now actively promoting the development of battery storage capacity. For regulatory guidance and implementation, they are looking explicitly at the United Kingdom (UK). Due in part to its geographical position and its reliance on fossil fuel resources in the North Sea, the UK recognised early on the importance of diversification and energy independence. The so called Clean Growth Strategy, derived from the UK Climate Change Act of 2008, was developed to strengthen the resilience and sustainability of the energy system. The UK has introduced regulations that enable renewable energy to be economically viable through the use of CfDs (Contracts for Difference - a minimum guaranteed price supported by the government) and various incentive schemes. The UK has also been deploying batteries for many years to support and stabilise the electricity grid.

Why now is an attractive entry point?

Returns on battery storage projects depend on several factors: construction and installation costs, contracted electricity prices (potentially in combination with CfDs), and prices on the electricity spot market. In recent years, battery prices (as well as the cost of other renewable energy equipment) have fallen significantly due to technological advancements that enable more efficient use of raw materials.



Source: iea.org, world energy outlook 2024, amendments a.s.r. real assets investment partners

The rising costs of labour and construction materials have slightly increased overall expenditures for building and installation. However, the battery itself remains the largest cost component - and this is precisely the element that has become significantly cheaper in recent years. As a result, the overall feasibility and attractiveness of BESS projects have improved. Lower revenues due to declining energy prices are offset by the reduced installation costs of BESS.

Assets typically combine a baseload contract with a fixed offtake price and a portion of merchant exposure. In the latter case, the owner - an IPP (independent power producer) - can trade on the balancing market. When operating in this market, the battery owner arbitrages intraday volatility in electricity prices.

For BESS projects, a.s.r. real assets investment partners frequently sees availability based contracts with a fixed price, potentially structured in the form of tolling agreements with grid operators or energy companies. The balance between fixed contract income and merchant exposure determines the overall risk level. An availability based project with long term contracts offers a yield of approximately 6–8% at a moderate risk level (core/core+). Returns (IRRs) for BESS projects are around 10% for de-risked assets with long term contracts and consist of both yield and capital appreciation. These returns can further increase to 12–15% for projects with more greenfield exposure and/or greater merchant exposure. Accordingly, the risk profile shifts toward core+ and value add. a.s.r. real assets investment partners also notes that the risk associated with merchant exposure may increase over time, as the balancing market could become less volatile if more batteries are deployed to stabilise the electricity grid.

According to a.s.r. real assets investment partners, renewables in general are currently valued neutrally, driven by lower energy prices and higher production costs. Battery storage forms part of the broader renewables sector, but the valuation outlook for batteries is specifically positive. The prospects for BESS projects - and therefore expected valuations - are favourable, supported by strong demand for storage capacity, falling battery prices, and expectations of stable energy prices. This makes the segment highly attractive for institutional investors.

Conclusion: battery storage deserves a place in every institutional investment portfolio

a.s.r. real assets investment partners identifies highly attractive opportunities for investments in BESS and considers it an excellent addition to real assets portfolios for institutional investors. BESS is appealing both from a fundamental perspective and based on current and expected future valuations, supported in part by strong return expectations.

There is substantial and growing demand for battery capacity to support the stabilisation of the electricity grid. By adding such diversifying assets, investment portfolios become more resilient and their risk/return profile improves. In addition, the market for batteries linked to energy generation is highly attractive. These projects are often managed by an IPP and offer higher returns at slightly higher risk, partly because they benefit from volatility in the balancing market. The underlying long term baseload contracts help to mitigate these risks.

Overall, a.s.r. real assets investment partners concludes that BESS investments - combining asset development and operations with long term contractual structures - offer investors stable and strong returns at a manageable risk level. According to a.s.r. real assets investment partners, an active allocation to this subsegment should therefore be an essential component of an institutional investor's portfolio.

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