The challenges of financing and de-risking BESS projects

Achieving bankable tolling capacity and tackling new risks from FCAs and co-location



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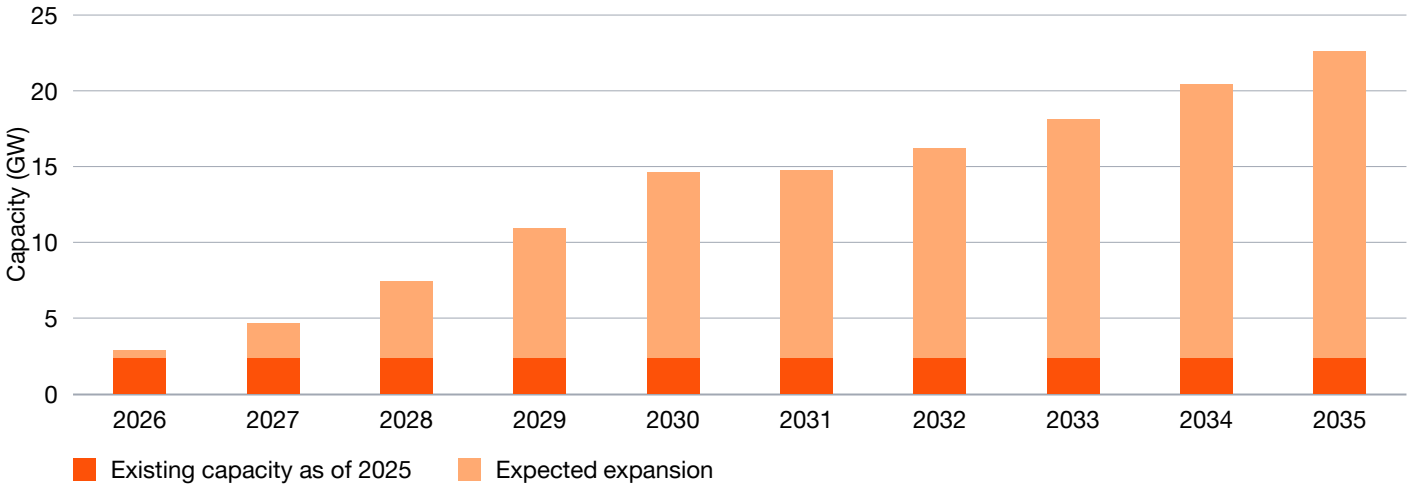
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01

Introduction: financing BESS is a capital-intensive business

Battery storage systems have a key role to play in the transition towards sustainable energy and in decarbonising the electrical grid. Accordingly, Germany needs to build battery energy storage systems (BESS) on a large scale between now and the mid-2030s. Most of these will be financed by debt capital, but fully merchant-based revenue is often insufficient to justify this, creating a financing shortfall. Tolling has the potential to close this gap if tollers can bring together sufficient operational expertise, risk capital and creditworthiness. Germany's current national grid development plan therefore envisages significant growth in installed BESS capacity – from around 2 GW in 2025 to 40 GW by 2037 – while the Forschungsstelle für Energiewirtschaft (Energy Industry Research Centre, or FfE) institute expects to see around 28 GW of capacity. Existing systems usually offer shorter storage durations of around two hours; this is initially expected to continue with new-builds, but the FfE predicts that new installations from 2030 onwards will tend towards longer storage durations of around four hours, reflecting the changing demand for flexibility in many markets.

Fig. 1 Expected installed BESS capacity in Germany

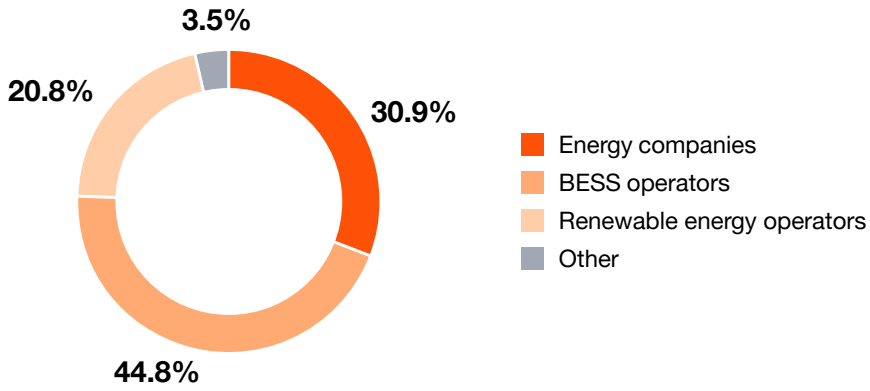


Source: FfE energy systems forecast, Q3 2026

The German BESS market is not dominated by established energy companies. An analysis of the Market Master Data Register (Marktstammdatenregister, or MaStR) shows that energy companies account for only 31% of currently operated BESS capacity, while the remaining 69% is operated by independent BESS operators, renewable energy operators and other market participants (see Figure 2). Many of these players are limited in their capacity to finance BESS, and are therefore often reliant on attracting additional external capital to cover the costs and get these projects completed.

Fig. 2 Operators of BESS in Germany

Figures show the percentage of total capacity operated by each type of company as determined by analysis, based on publicly available information, of the portfolio structures of all companies listed in the core energy market data register.



Source: German Federal Network Agency core energy market data register, May 2026.



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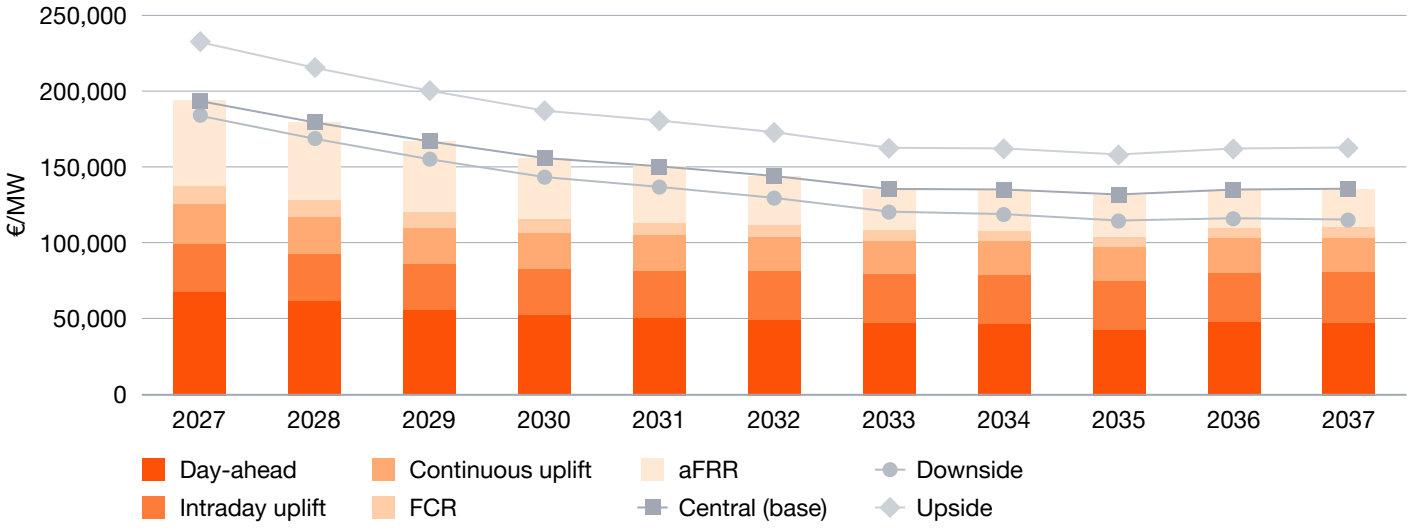
Available options for financing BESS heavily depend on how they are marketed

Operating cashflows in BESS projects are usually generated by revenue stacking. Standalone BESS are capable of rapidly drawing electricity from or discharging electricity into the grid, giving them the flexibility to exploit various revenue pools – such as optimising on the day-ahead market, optimisation and trading on the continuous intraday market or bidding in balancing energy markets. New markets for system services – such as reactive power and inertia – have been available for battery installations to serve since 2025, and it is likely that further markets where BESS could provide flexible capacity will be created in the future.

Co-located BESS – i.e. BESS installed at the same location as a renewable power generation system – are additionally linked to this system. This allows the BESS to regulate how renewable electricity is fed into the grid (e.g. to qualify for EEG market premiums) alongside market-driven optimisation. In the case of a BESS designed exclusively to store green electricity, additional revenues may be available under renewable energy legislation. However, compared with a grey-electricity storage configuration, this means foregoing the currently attractive revenues from market-based optimisation of the asset's remaining flexibility.

Figure 3 shows the projected revenue per MW of a two-hour standalone system, assuming 90% round trip efficiency and 90% depth of discharge. The results were calculated using a PwC cash flow projection model designed for BESS and electricity price curves from the FfE.

Fig. 3 Projected revenue (€/MW) of an optimised two-hour standalone system, disregarding FCAs



Source: PwC analysis using FfE data.

Figure 3 shows that a significant proportion of BESS projects' full-life cashflow will be generated in the near future. This is due to the fact that renewable energy generation is not currently being balanced by flexible generation and storage systems, either in terms of installed capacity or installation rate. As deployment of flexible installations increases, the situation is expected to gradually reach equilibrium, driving down BESS revenues. However, it remains to be seen when this development will occur, as it depends on complex interactions between multiple factors: these factors include changes in the regulatory framework and funding mechanisms for renewables and energy storage assets, the shape of any capacity market that might develop, changes in the energy mix, and deployment of home energy storage systems and electromobility.

On top of these underlying factors, a BESS's grid connection also has an impact on its revenue: these connections are governed by a wide variety of flexible connection agreements (FCAs), which can limit operations in numerous different ways. Modelling by the FfE shows that FCAs can cause revenue loss varying between 10% and 35%, depending on the nature and combination of restrictions in question. To ensure robust project assessment and financing, it's therefore essential to analyse the exact conditions of the FCA for the project site at an early stage, and to factor its impacts into revenue forecasts.

Financing for BESS projects needs to consider operating cashflow over time, applicable influencing factors and relevant risk scenarios.[1] In many cases, the aim is to use the high, relatively stable cashflow in the early stages of the project life cycle to recoup as much of the initial investment as possible. To mitigate cannibalisation risk later on, additional mechanisms are also often built in to handle the refinancing of remaining liabilities when the project's initial debts come due.

To achieve these aims when using financing from external lenders and banks, the financing agreements need to be closely coordinated with the agreements for operating and marketing the BESS. These marketing agreements are set up between the project company and independent flexibility marketers or the trading units of big energy companies (see Figure 4) as revenue sharing/fully merchant agreements (with a floor if necessary) or as tolling agreements.[2]

Three main types of tolling agreements have emerged on the market. They vary in terms of how responsibility for operation, risk and flexibility are spread between the operator and the offtaker:

- **Physical tolling:** the offtaker markets and controls the BESS, integrating it into its balancing group, while the operator is responsible for ensuring it remains available to operate. This model is usually the easiest for banks to understand, as it clearly allocates rights and responsibilities. The remainder of this paper focuses primarily on physical tolling arrangements, which are currently the most directly relevant structure for project financing.
- **Virtual tolling:** this involves bringing several BESS together to create a flexible pool of capacity. The offtaker receives a defined level of capacity as laid down in the contract, but this may be provided by any of the assets in the pool. This approach reduces the risk posed by outages, but only works if the operator has a big enough portfolio of BESS.
- **Financial tolling:** marketing remains the responsibility of the operator or the operator's chosen optimiser, and a financial agreement is used to exchange volatile market revenue for fixed payments. This model gives greater flexibility for the operator, allowing them to switch to another optimiser if necessary.

[1] See also "Bankability by Design: Finanzierung und Vermarktungsmodelle für Batteriespeichersysteme", a white paper by Suena and Capcora, for a detailed examination of the individual aspects of a BESS project as they affect creditworthiness.

[2] In addition to tolling, there are a number of other, more specialised marketing models in use, such as partial tolling – this involves marketing some of the BESS's capacity through a tolling agreement and obtaining revenue for the remainder via revenue sharing, day-ahead swaps or other virtual agreements.

Fig. 4 Market overview: BESS marketers by type

Marketers (not exhaustive)				
Established energy companies	**EnBW AG**	**RWE AG**	**Alpiq Holding AG**	**ENGIE SA**
	Uniper SE	**Statkraft AS**	**BayWa r.e AG.**	**Axpo Holding AG**
	Vattenfall AB	**BKW Energie AG**		
Optimisers with partners	**Next Kraftwerke GmbH** Shell[1]	**Energy2market GmbH** EDF[1]	**Danske Commodities** Equinor[1]	**suena energy GmbH** Eneco[1]
	Centrica plc Centrica[1]	**ane.energy GmbH** Hamburger Energiewerke[1]	**Quadra Energy GmbH** TotalEnergies[1]	**Trianel GmbH** 53 municipal utility companies[1]
	FlexPower Citadel[1]	**The Mobility House GmbH** Daimler[1]		
Optimisers without partners	**Entrix GmbH**	**ESFORIN SE**	**enspired GmbH**	**Pure Energy GmbH**

[1] Owner/lead investor/partner

Source: PwC analysis.

The basic model for marketing BESS is the revenue-sharing model. This involves the optimiser bringing the BESS to markets specified in the agreement in return for a percentage of the resulting revenue. Risks and rewards in this setup are largely borne by the asset owner or project company and the investors.

As BESS lack secure revenue streams in the long term, this model usually only allows a limited proportion of the financing needed for a project to be obtained through debt financing: at present, not many banks offer financing for entirely merchant-based BESS projects. Most banks are primarily concerned with limiting risk exposure on these projects, which manifests itself in the use of conservative benchmarks for projected earnings (e.g. additional safety margins in revenue forecasts) and financing structures (e.g. short-maturity loans).

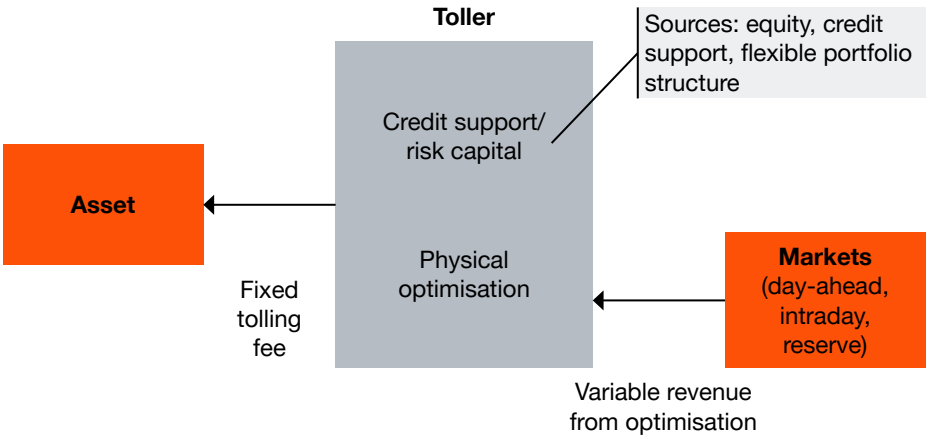


Tolling

Closing this financing gap and making BESS projects bankable requires operating cashflow to be de-risked. To address this financing gap, marketers and energy traders have introduced floors into revenue-sharing agreements and developed tolling agreements that provide greater revenue certainty.[3]

These agreements combine physical optimisation and marketing of BESS capacity with financial credit support, the latter being used to secure the agreed fixed floor rate (in € per MW per year) as shown in Figure 5.

Fig. 5 Tolling-based marketing



[3] The remainder of this paper focuses on tolling. Agreements incorporating floors offer less protection than tolling agreements, but they also allow companies to seize additional opportunities that may arise on the market. In the case of an agreement with a floor but no cap, additional revenue obtained in this way is shared between the parties as laid down in the agreement, with no upper limit. If the agreement incorporates a cap, the revenue received by the asset owner is contractually limited: revenue below the floor will result in the owner receiving the agreed minimum payment, and revenue between the floor and the cap will be shared between the parties, but revenue above the cap will not result in the asset owner receiving any additional earnings.

Tolling agreements are generally structured as follows:

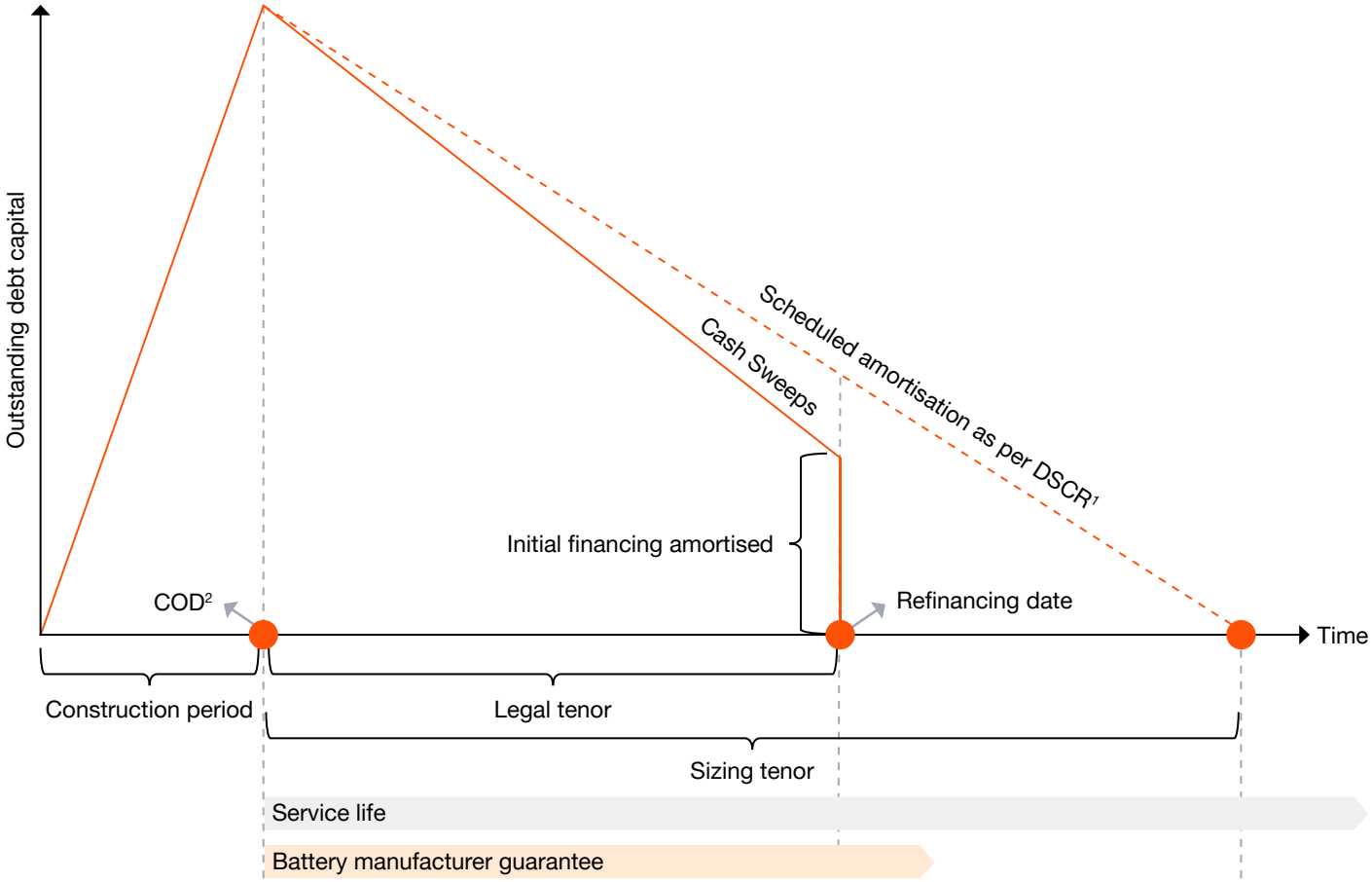
- The **asset owner** transfers operation and day-to-day control of the BESS to the toller. The toller must respect the restrictions laid down in the agreement to ensure that the BESS's technical performance and guarantee conditions are not compromised.
- Cashflow obtained from operating the BESS in the day-ahead, intraday and reserve markets passes to the **toller**, with the asset owner receiving fixed payments. These fixed payments are often significantly lower than the BESS's expected operating revenue, thus rewarding the toller for assuming merchant risk.
- The **asset owner** remains responsible for maintenance, repairs etc.
- **Credit support** is provided directly, based on the toller's creditworthiness. If this is insufficient, the toller works with a financially sound partner.

Under a tolling agreement, the asset owner or project company exchanges volatile BESS operating revenues for a predictable stream of fixed payments. This considerably simplifies financing if the bank providing finance considers the toller bankable – i.e. the toller is sufficiently creditworthy or can provide enough collateral to secure a long-term tolling agreement.

> Tolling makes volatile BESS revenue more predictable – a cornerstone of making BESS projects bankable.

Structuring such business models requires close coordination between the tolling agreement, the financing agreements (duration, covenants, cashflows), manufacturer guarantees, and the design of the installation at the technical level (see Figure 6).

Fig. 6 Typical mini perm structure for financing a BESS



[1] DSCR: debt service coverage ratio
[2] COD: commercial operation date
Source: ABN AMRO Bank N.V.

As Figure 6 shows, tolling agreements can have a significant impact on how much financing is available. The availability of financing available will immediately increase if the fixed tolling payment increases (and with it, the loan repayments that can be made in a given year). Such an increase may result from factors such as the toller being willing to apply lower premium in his pricing, or from an increase in the percentage of the BESS's capacity made available for tolling. Available finance will also increase with longer tolling agreements, as these allow the fixed income from tolling to be used for loan repayments for longer.[4]

[4] The exact terms of the agreements for a specific project can also lead to variable tolling payments – these may include factors such as indexing, adjustment clauses or availability clauses.

Another lever to increase available financing is to contractually mitigate the risk posed by falling revenue in the middle/late phases of the project life cycle, as this mitigates the associated refinancing risk for the bank. This can be done by means such as putting a portion of revenue into an escrow account as security against balloon risk, or by using surplus funds to repay loans early through cash sweeps. These strategies reduce the remaining debt (the "balloon") that will need to be refinanced when the project's initial debts become due, thus reducing the bank's refinancing risk.

There are also other objectives pursued by asset owners, optimisers/tollers and banks that need to be considered when structuring tolling agreements and financing agreements:

- **Asset owners** want to optimise the risk profile of their equity cashflow, which means that they are often interested in retaining a certain upside potential. They might do this by means such as only tolling some of their available BESS capacity and flexibly marketing the remainder so that they can continue to capitalise on any good opportunities that may arise in the market.
- The shape of the electricity market will continue to change in the future: new markets may emerge or new regulations may be introduced, and it's vital to ensure that tolling agreements enable responses to such changes that are acceptable for both the **asset owner and the toller**. Opportunities may arise for structuring BESS projects – for example, if participation in a future capacity market creates secure, long-term revenue streams backed by a counterparty with very strong finances, such as a transmission system operator. However, risks may also arise as well, such as changes to grid fees (see Chapter 4).
- The **service life and degradation** of BESS depends, in part, on how they are operated day to day. This creates a conflict between the objectives of the optimiser and those of the asset owner and external investors, which tolling agreements must reconcile. Optimisers want as much operational freedom as possible to maximise the variable revenue available from the market, while owners and investors need their asset to retain its performance and marketability in order to refinance it and remarket it after the tolling agreement comes to an end.

03

Increasing tolling capacity: a strategy for facilitating BESS financing

To obtain financing, large BESS projects often aim to de-risk 50% to 70% of their capex through tolling agreements. Based on this statistic, it is likely that a total of between 10 GW and 14 GW of tolled BESS capacity will be needed in the German market by the mid-2030s.

But this high demand may only be met by a limited supply, as there are few players with both sufficient creditworthiness to engage in long-term tolling and the expertise necessary for 24/7 multi-market optimised operation of a BESS – i.e. integrated or incremental optimisation across all reserve markets, auctions (day-ahead and intraday) and continuous intraday trading.

Alongside the trading units of major energy companies, these players include a variety of new entrants, such as Enspired, Suena, Entrix and The Mobility House, offering flexible capacity marketing for BESS and other flexible assets such as combined heat and power units, biogas plants and many more. The trading units of large municipal and regional utility companies, by contrast, are either not in a position to do so or have only just started building the necessary capabilities.

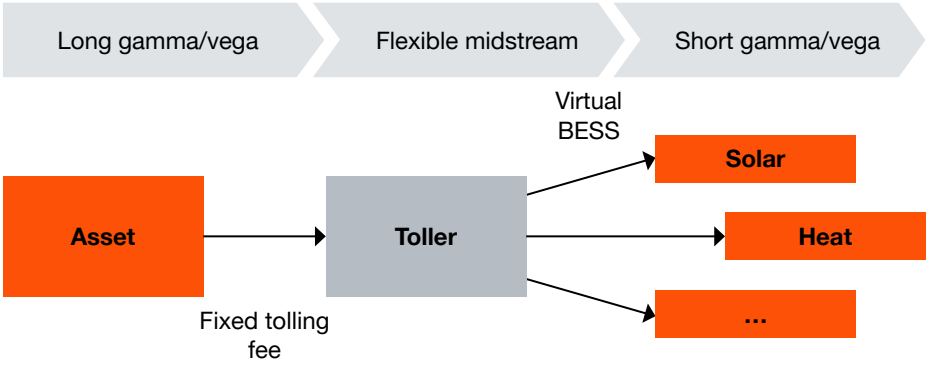
The new players usually also lack sufficient equity or collateral to assume the merchant risk of operating a BESS. In the absence of additional credit support, this means that they can usually only conclude revenue sharing agreements for BESS, not tolling agreements. As a result, many of these players have entered into joint ventures or mergers with stronger partners to gain access to the credit they need (see Figure 4).

Structuring portfolios to generate tolling capacity

The trading units of major energy companies are generally creditworthy counterparties for tolling agreements. They also often have extensive experience in managing asset positions at a scale (relative to the available market liquidity) that most new players do not. But even these big players cannot provide unlimited quantities of risk capital to secure merchant risk from third-party BESS projects – particularly where risk capital is also required to support merchant exposure from their own BESS portfolios.

Against this backdrop, building flexible midstream portfolios in energy company trading units offers a promising opportunity to free up risk capital held in long tolling positions, in turn allowing this capital to be used to originate new tolling deals (see Figure 7).

Fig. 7 Marketing a BESS with a tolling agreement



Source: PwC.



As shown in Figure 7, a flexible midstream position does not involve energy traders marketing tolled flexible capacity directly on the wholesale markets (day-ahead, intraday and balancing energy). Instead, purchased capacity is sold to other market participants in the form of “virtual batteries”, allowing these players to hedge existing market risk exposures in their asset portfolios or power procurement portfolios. Table 1 shows various categories of market participants who could optimise their physical and financial risk positions by entering into such deals with an energy trader to reduce their market price risk, along with their projected capacity in Germany in 2026, 2030 and 2035.

Tab. 1 Capacity of producers and consumers who could use tolling to reduce market price risk

Figures show installed capacity in Germany (GW)	2026	2030	2035
Non-subsidised windfarms	17.4	24.1	31.4
Non-subsidised solar farms	11.2	26.5	46.8
“Must-run” non-renewable generation systems (industrial, biomass plants)	11.85	10.08	7.34
Data centres	3.49	4.59	6.60
Electrolysis	0.51	3.9	9.45

Source: FfE energy systems forecast, Q3/2026.

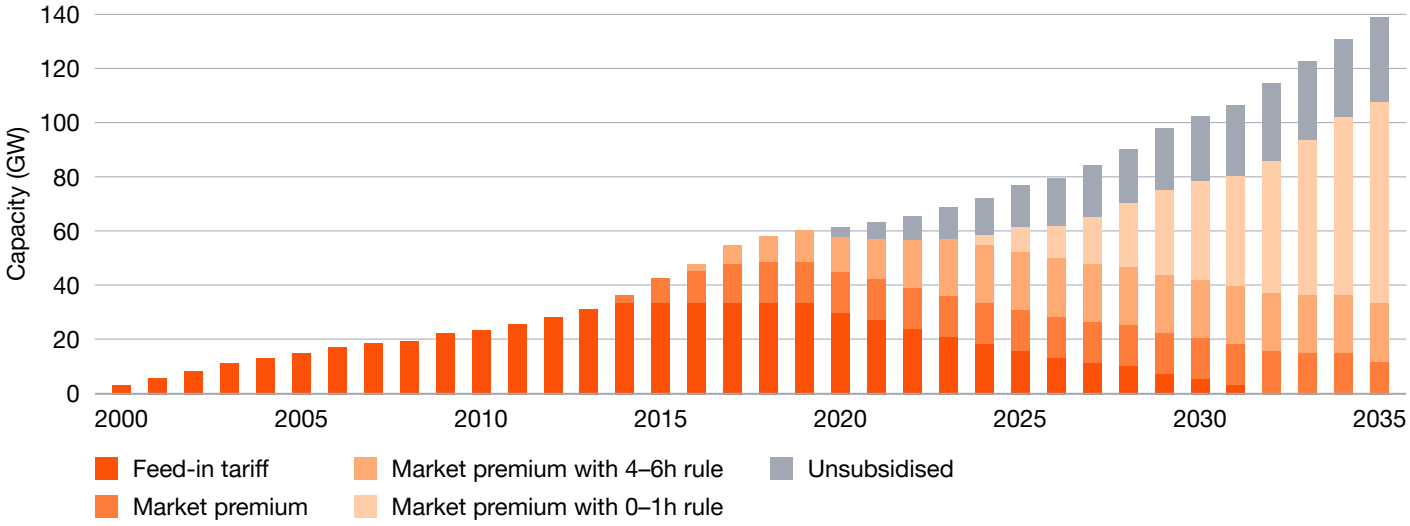
By installed capacity, non-subsidised solar and wind power systems are the largest pool of market participants exposed to market price risk. Under Germany’s Renewable Energy Sources Act (Erneuerbare-Energien-Gesetz, or EEG), solar and wind power systems qualify for feed-in tariff or market premium payments for their first 20 years of operation. After this period has elapsed, EEG subsidies for these systems come to an end, and the electricity they produce is sold exclusively on the spot markets. Once support expires, these assets become fully exposed to market price risk, as their weather-dependent generation profiles coincide with volatile wholesale power prices. Figures 8 and 9 show that around 31 GW of wind power and 47 GW of solar power generation capacity will drop out of EEG funding and thus become available for tolling by 2035. For new renewable power generation systems, market premiums are now subject to the 0-hour or 1-hour rule if the spot price drops below zero. This creates significant remuneration risk, making systems under these rules interesting candidates for entering into virtual battery deals with energy traders. Capacity in this category is set to rise significantly by 2035, to 75 GW of wind and almost 130 GW of solar power.

A similar challenge exists for non-renewable power plants that are not purely market-oriented whenever the need to generate heat conflicts with economic operation. Such plants are equally susceptible to low or negative electricity prices, creating market price risk that can be hedged with virtual batteries and similar structures.

Major consumers of electricity may also be indirectly subject to market price risk and thus be able to profit from tolling, particularly in the case of installations with dedicated renewable electricity generation systems. Renewable power systems built to deliver power for electrolysis, data centres or heavy industry are typically oversized to compensate for the fact that average power output is significantly less than total installed capacity. Installations of this nature need a hedge position for the excess power which results at periods of peak generation.

Fig. 8 Wind power capacity by remuneration schedule

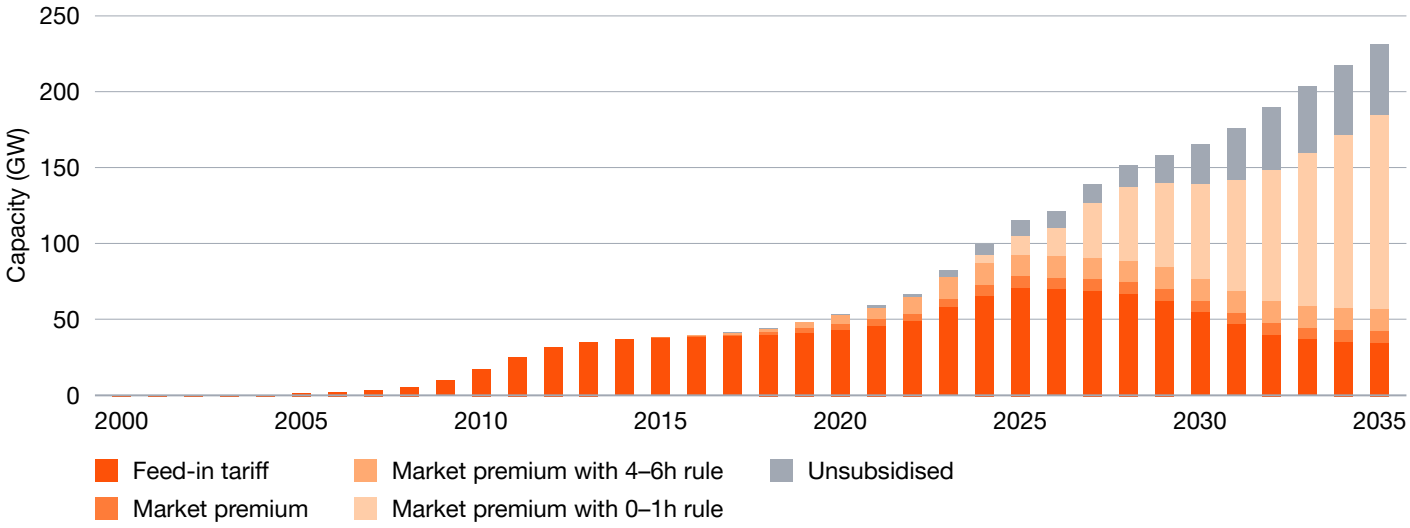
In 2013, a significant but undetermined number of wind farms moved from feed-in tariff to market premium, although this did not extend their subsidies. The “unsubsidised” category includes both systems which have always been unsubsidised, and those which have dropped out of EEG subsidies after expiry of the 20-year limit.



Sources: German Federal Network Agency core energy market data register, June 2026 (data to 2025); FfE energy systems forecast (future data)

Fig. 9 Solar power capacity by remuneration schedule

The “unsubsidised” category includes both systems which have always been unsubsidised, and those which have dropped out of EEG subsidies after expiry of the 20-year limit.



Sources: German Federal Network Agency core energy market data register, June 2026 (data to 2025); FfE energy systems forecast (future data).



04

Outlook: upcoming challenges from FCAs, network tariff rules and co-location

As examined above, tolling can reduce risk and thus make it easier to finance BESS projects. Multi-market optimisation enables strong yet variable revenue streams, which are used to pay the toller for providing credit support.

Nevertheless, some uncertainties around this model remain in the long term. New regulations and changes in the market may reduce the revenue available from multi-market optimisation, or make it less predictable. Tollers will counter this with higher risk premiums and more conservative tolling agreements, which in turn will make financing BESS projects more challenging.

In light of this, it's important to be realistic about regulatory changes and future opportunities for marketing BESS capacity, which requires a holistic view of marketing and financing. Doing this will allow tolling to be further developed in line with the market and regulations, retaining its benefits for BESS financing.

> The economic viability of a BESS is not just a question of the market – grid connection, regulations and co-location also affect its long-term value.

Table 2 provides an overview of new developments in the energy sector and the regulatory sphere, and their impacts on BESS marketing. These impacts are explained in detail below.

Tab. 2 Potential impacts of new developments in the energy sector and the regulatory sphere on BESS marketing

	Positive impacts	Negative impacts
FCAs	Limited compensation may be available in relation to the grid connection contribution (Baukostenzuschuss, BKZ)	Restrictions will reduce revenue; reduced freedom to optimise will make financing more difficult
Network tariff system (AgNes) reform	Dynamic network tariffs will provide additional sources of income	Fixed network tariffs will reduce revenue (even if heavily discounted); dynamic network tariffs may generate additional costs in some regions
Co-location	Integration of renewable power installations; quicker and cheaper grid connections	Renewable energy profile and overplanting will reduce freedom to optimise
New use cases	Potential new sources of revenue will make financing easier	Additional revenue hard to predict, in part because this will depend on regulations

Energy industry factors affecting BESS value retention and financing

The most important factor influencing BESS operation is flexible connection agreements (FCAs). Instead of granting the full capacity that a grid connection could provide at all times, FCAs impose limitations. There are many different types of constant and dynamic restrictions and different ways that they can be used – for example, limiting or completely shutting off the connection to the grid or certain markets, or applying multiple different remuneration models.

It is very likely that most new grid-connected BESS will be subject to some form of FCA, meaning that operators will be at least somewhat restricted in how and when they can charge and discharge the system, and in accessing certain markets (typically balancing power). FCAs thus have a direct negative impact on multi-market revenue and restrict operator freedom, and compensation through FCAs will not be enough to offset these losses in most cases. When building a business case and drawing up tolling agreements, it is therefore vital to fully consider the exact restrictions that the project will be subjected to.

Another factor is the German Federal Network Agency's reform of its General Electricity Network Tariff System (Allgemeine Netzentgeltsystematik Strom, or AgNes). Until now, BESS have been fully exempt from network costs, but the reform is set to change this. At the time of writing, the reform is set to impose fixed but discounted network tariffs on BESS which go online after 4 August 2029 and for which no final investment decision (FID) has been reached by the time the AgNes reform enters into force, which is expected to be at the beginning of 2027. These tariffs will have a negative impact on BESS revenue, although the discount means that their impact will only be moderate. By contrast, dynamic network tariff components proposed in the reform may have a positive impact: these are both charges and credits reflecting local grid conditions and incentivising behaviour that benefits the grid. Particularly in situations where peak renewable power generation creates issues for the grid, the impact of these dynamic tariffs will positively correlate with spot trading for battery storage, creating an additional revenue source in multi-market BESS operations.

The last key factor from the energy sector is co-location: the integration of BESS with renewable power generation systems, especially solar and wind farms. Co-located systems have a single grid connection for both the BESS and power generation, which means that decisions on using the BESS on the spot market or balancing market need to reflect how much power is being generated at the time. Although this generally limits freedom for multi-market optimisation of the BESS, the improved integration between power generation and storage that co-location provides opens up new opportunities to generate revenue.

Further opportunities to generate revenue will arise in the future, such as providing inertia and reactive power, or participating in a potential new capacity market. Opportunities such as these could help increase and secure long-term BESS revenue, over and above existing multi-market operations. However, these opportunities are as yet uncertain, and so cannot be fully taken into account in risk assessments; they will also not deliver enough additional income to fully offset the reductions in revenue discussed above.

Impacts on the business models of tollers, asset owners and banks

The tolling model involves the toller assuming the merchant risk arising from price volatility and revenue uncertainty. This risk is compensated by potential revenue from free multi-market optimisation. Restricting operational freedom and predictability of revenue (as FCAs, co-location and network tariffs will do) will make merchant risk harder to model, hedge and price. This will lead to tollers having to accept greater uncertainty in their trading portfolios.

In turn, tollers will probably compensate for this development by becoming more selective: instead of assuming every BESS's merchant risk, they will examine each planned project in terms of its location and other factors, and thoroughly assess new developments in the regulations. This is likely to lead to higher risk premiums, lower tolling fees and more restrictive agreements (e.g. shorter duration, more conservative terms and conditions), which will make tolling a less attractive proposition for both parties. New use cases with the potential to generate additional revenue, on the other hand, are a promising area for tolling. The exact revenue-generating potential of any particular use case is hard to predict, but it can generally be assumed that multi-market optimisation will deliver at least slight increases in revenue.

Asset owners will also have to devote more attention to structuring and risk management issues. As they will no longer be able to focus solely on constructing, operating and financing their BESS and outsource the risk to their tollers, asset owners will want to obtain attractive tolling conditions in the future. This will require them to align their business models with the toller's operational and commercial requirements, while also considering the grid operator's requirements, site-specific connection restrictions and expected regulatory changes from an early stage.

Banks will continue to prioritise predictable, long-term project cashflows, such as those provided by tolling agreements. However, assessing each project will become more demanding if limited multi-market optimisation from standalone BESS leads to increased cashflow volatility, less predictability, and more project-specific, less standardised tolling agreements. Co-located BESS, by contrast, could reduce portfolio risk from a banker's perspective, as these projects involve the BESS and other assets (e.g. solar arrays) working together. Factors such as the toller's creditworthiness or robustness against changes in regulations will become more important, and financing will become more difficult and be awarded more selectively. Nonetheless, tolling will remain an effective strategy for financing and de-risking BESS projects.

Recent deals show that these problems can be solved. **MVV Trading**, for example, has agreed a fixed-price deal for marketing a MaxSolar co-located BESS. **Entrix's** latest deal provides another innovative example: a day-ahead swap has been agreed with Deutsche Bahn to provide continued access to flexible capacity, compensating for fluctuating power consumption from the company's renewable portfolio.

Contacts



Florian Mayr
Partner, Strategy& Germany
florian.mayr@pwc.com



Julian Holler
Director, PwC Germany
julian.holler@pwc.com



Jennifer Roloff
Senior Associate, PwC Germany
jennifer.roloff@pwc.com



Timo Kern
Head of Energy System and Markets, FfE
tkern@ffe.de



Lennart Herrmann
Senior Research Consultant, FfE
lherrmann@ffe.de

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The Forschungsstelle für Energiewirtschaft (Energy Industry Research Centre, or FfE) has spent more than 75 years as one of Germany's leading energy research and consulting institutes. Our interdisciplinary team of more than 70 experts develops practical solutions for the challenges of the energy industry. A non-profit organisation with offices in Munich and Berlin, we provide research-based, independent and neutral answers to the question of what form tomorrow's energy system should take. Our work is built on quantitative analyses at the intersection of technology and economics, using scientific methods to create independent decision-making tools that help companies and society to seize the opportunities offered by today's energy transformation. Research creates knowledge, knowledge creates practice: our entire philosophy is built on this mantra, and it is reflected in all we do. We're passionate about our work – whether it's creating innovative solutions to drive transformation of the energy industry, or training the next generation of researchers.

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