CREDIT OPINION
22 October 2024

Update

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RATINGS

EnBW Energie Baden-Wuerttemberg AG

Domicile	Karlsruhe, Germany
Long Term Rating	Baa1
Type	LT Issuer Rating
Outlook	Stable

Please see the ratings section at the end of this report for more information. The ratings and outlook shown reflect information as of the publication date.

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EnBW Energie Baden-Wuerttemberg AG

Update following affirmation of Baa1 rating

Summary

The credit quality of EnBW Energie Baden-Wuerttemberg AG (Baa1 stable), Germany's (Aaa stable) only fully vertically integrated utility, is supported by its scale and its leading position in its home state of Baden-Wuerttemberg; the solid share of regulated and predictable earnings from its distribution and transmission grid operations; the increasing profit contribution from its largely contracted renewables generation, underpinned by capacity growth; and its balanced financial policy and demonstrated commitment to maintaining robust credit quality.

EnBW's credit quality is constrained by its sizeable (gross) investment programme of €40 billion over 2024-30, which is focused on grid infrastructure and renewable installations and will likely lead to temporary pressure on credit metrics before projects start returning cash. Although the company's strategy to selectively and partially divest shares in projects, presumably mainly in the grids and renewables segments, will help mitigate the net cash outflow, this approach comes at the expense of increased cash leakage to minority shareholders and could hurt the business risk profile over time.

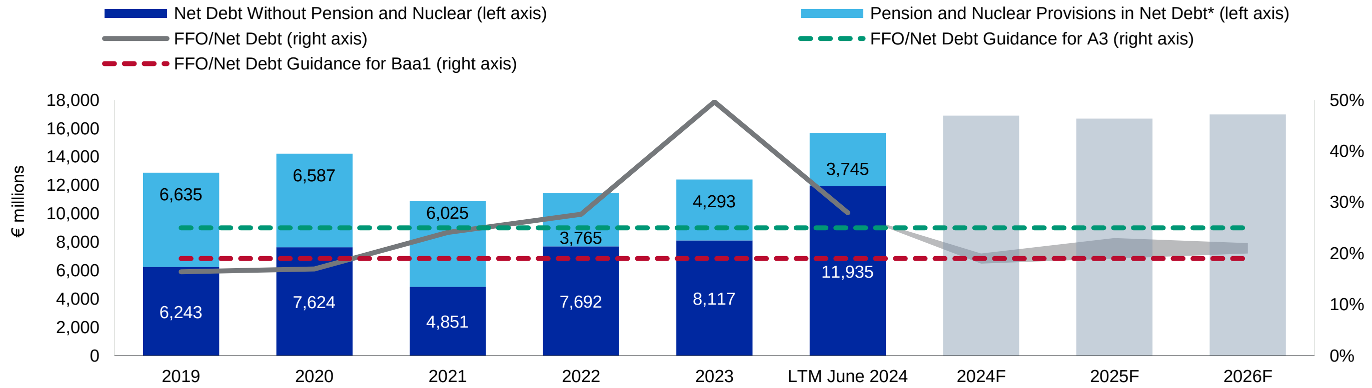
In addition, the company remains exposed to volatile energy prices and Germany's evolving decarbonisation policies through its still-substantial, although declining, domestic conventional generation capacity; and faces intense competition in the retail markets for energy and related services.

Because of the 46.75% ownership by the Land of Baden-Wuerttemberg (Aaa stable), we consider EnBW a government-related issuer (GRI). Based on our expectation of a moderate support probability by the state government in case of financial distress, the Baa1 rating factors in a one-notch uplift from EnBW's standalone credit quality, or Baseline Credit Assessment (BCA), of baa2.

Exhibit 1

Notwithstanding falling power prices and significant planned investments, we expect EnBW to stay within the guidance for its current rating

Net debt and funds from operations (FFO)/net debt



All figures and ratios are based on adjusted financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations. Periods are financial year-end unless indicated. LTM = Last 12 months. Moody's forecasts are Moody's opinion and do not represent the views of the issuer. *Pension and nuclear provisions are shown net of dedicated financial assets. Net debt without Pension and Nuclear as per LTM June 2024 excludes €2,782 million of current financial assets.

Sources: Moody's Financial Metrics™ and Moody's Ratings forecasts

Credit strengths

» High share of earnings from regulated transmission and distribution grids under an established regulatory framework

» Growing share of renewable assets, mostly backed by feed-in tariffs or power purchase agreements (PPAs)

» Track record of measures to defend credit quality and commitment to maintain solid investment-grade rating

» Supportive shareholders, reflected by moderate dividend extractions and our view of a high likelihood of a substantial €3 billion equity increase in 2025

Credit challenges

» Large capital spending programme will constrain credit metrics, mitigated by proceeds from disposals

» Expected increase in the share of minorities in the capital structure increases risk of cash leakage and could alter the business risk profile

» Earnings exposed to wholesale price volatility, mitigated through hedging; and resource risk from the growing share of renewable assets

» Dynamic evolution of decarbonisation policies, which increases strain on conventional generation

Rating outlook

The stable outlook reflects our expectation that EnBW will record solid cash earnings over 2024-26, which will allow the company to continue to fund a substantial share of capital spending from generated cash flow. Moreover, the stable outlook factors in our expectation that the company will maintain a prudent financial policy and put in place mitigants should its funds from operations (FFO)/net debt fall below 19% or retained cash flow (RCF)/net debt fall below its 14% target.

Factors that could lead to an upgrade

We do not expect upward pressure on the rating because of EnBW's planned sizeable capital spending. However, such upward pressure could develop over time if EnBW's FFO/net debt increases above the mid-20s in percentage terms on a sustained basis.

Factors that could lead to a downgrade

We could downgrade EnBW's rating if its credit metrics remain persistently below the above-mentioned guidance, with its FFO/net debt below 19% and RCF/net debt below 14%. A decline in the government support assumption incorporated into EnBW's rating is also likely to lead to a rating downgrade.

The guidance for EnBW's rating may be tightened further if the level of minority interests increase beyond what is currently anticipated or the business risk profile deteriorates.

Key indicators

Exhibit 2

EnBW Energie Baden-Wuerttemberg AG

	2019	2020	2021	2022	2023	LTM Jun-24	Moody's 12-18 month forward view
(CFO Pre-W/C + Interest) / Interest Expense	4.6x	5.7x	6.4x	5.0x	7.2x	5.3x	4.8x - 5.6x
(CFO Pre-W/C) / Net Debt	16.4%	17.0%	24.1%	27.7%	49.6%	27.9%	20% - 23%
RCF / Net Debt	13.7%	13.9%	20.5%	24.0%	46.1%	23.8%	15% - 18%

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Sources: Moody's Financial Metrics™ and Moody's Ratings forecasts

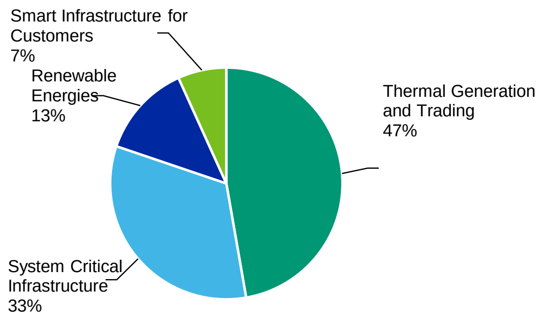
Profile

EnBW Energie Baden-Wuerttemberg AG is one of the leading utilities in Germany, with a dominant position in the south-western state of Baden-Wuerttemberg, one of Europe's wealthiest regions. Its vertically integrated energy activities serve around 5.5 million customers and comprise electricity generation and trading; transmission and distribution networks; renewables (RES); and the supply of electricity, gas and related services.

Exhibit 3

Regulated grids that make up the large majority of earnings in the System Critical Infrastructure segment account for a substantial share of EnBW's earnings

Adjusted EBITDA breakdown as reported by EnBW (LTM Jun-24)

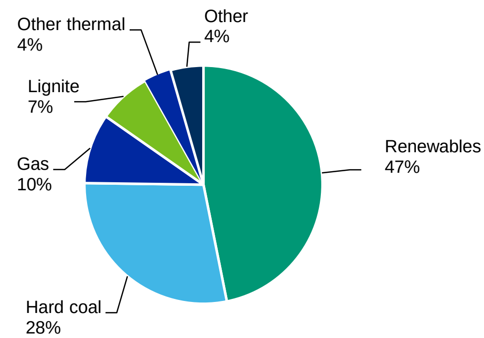


LTM = Last 12 months.
Total adjusted LTM Jun-24 EBITDA is €5.5 billion. Renewable Energies, Thermal Generation and Trading together constitute the "Sustainable Generation Infrastructure" segment.
Sources: Company filings and Moody's Ratings

Exhibit 4

EnBW's generation capacity is dominated by renewables

Installed capacity (year-end 2023)



Total capacity: 12.2 gigawatt (GW); nuclear generation ended on 15 April 2023.
Sources: Company filings and Moody's Ratings

EnBW's majority shareholders are the Land of Baden-Wuerttemberg and Zweckverband Oberschwaebische Elektrizitaetswerke (OEW), an association of nine administrative districts. Each entity holds a stake of 46.75% via subsidiaries. A further 4.05% is owned by several municipal associations in Baden-Wuerttemberg, with the remainder held by EnBW as own shares (2.08%) or free float (0.39%) on the Frankfurt and Stuttgart stock exchanges. The market capitalisation of EnBW on 22 October 2024 was around €18.3 billion.

Detailed credit considerations

System-Critical Infrastructure (SCI): Expansion of regulated electricity and gas networks will require large capital spending, accompanied by a gradual increase in cash earnings

The economics of EnBW's SCI segment are mainly determined by its earnings and capital spending associated with its power and gas distribution grids, mainly operated by its subsidiary Netze BW GmbH (100%); gas transport (ONTRAS Gastransport GmbH and terranets bw GmbH; each 100%); and electricity transmission (TransnetBW GmbH, 50.1%[1]). These grids operate under the German regulatory framework, which we regard as well defined, with key aspects of the revenue building block enshrined in law, and designed to provide adequate and fair remuneration for operating expenses and capital spending.

Following amendments of the German Energy Act in December 2023 to ensure greater independence of German regulator Bundesnetzagentur (BNetzA), we expect adjustments to the regulatory process over time, and a closer alignment of the regulatory mechanisms with the energy transition from the fifth regulatory period (RP), which will start in 2029 and 2028 for electricity and gas grid operators, respectively.

RPs comprise five calendar years, with electricity grid operators currently being in the first year of the fourth RP (2024-28), while gas grid operators are currently in the second year of the fourth RP (2023-27). Significant features of the regulatory framework include the following:

» A regulatory account mechanism under which certain volume and cost deviations in year t are offset over three years (t+3 through t +5);

- » Cost inflation adjustments, offset against company-specific (X-Ind) and sectorwide general productivity factors (X-gen, separate for electricity and gas) to provide incentives to increase cost efficiencies;
- » Cost of debt essentially treated as a pass-through item, notwithstanding some efficiency evaluation by BNetzA;
- » Capital returns through depreciation and a return on equity (RoE) based on the regulated asset base (RAB).
- » In terms of gas grid operations, existing and new RAB assets may be depreciated in full by 2045[2], the current target year for Germany's carbon-neutrality, to reduce the risk of stranded assets

For the current RP, BNetzA has yet to determine the X-gen factors for electricity and gas, though for gas, the regulator released a draft in September 2023, proposing 0.75% per annum, up from 0.49% per year in the third RP (electricity was 0.9%). A low X-gen would be credit positive because it would allow operators to retain most of the regulatory cost inflation adjustments. As for X-Ind, EnBW's electricity grids are mostly solidly positioned in the highest decile against the benchmark, although scores for the gas grids are slightly weaker, which means that the pressure to achieve cost efficiencies is higher. However, in September 2023, the Federal High Court decreed that BNetzA's efficiency test for gas distribution grid companies was flawed and needs to be revised. Thus, there is upside potential for the relevant EnBW subsidiaries.

Adjusted RoE calculation provides higher returns for new investments from 2024

Depreciation and the RoE constitute the main source of grid operators' cash earnings and are a function of the RAB evolution. The RAB is calculated under the capital cost adjustment (CCA) model[3], which aims to include new investments in the RAB without delay during the year of the investment, thus ensuring faster cash remuneration for all capital spending.

In October 2021, BNetzA set the RoE at a significantly lower level for the fourth RP than for the third RP, specifically 5.07% against 6.91% (nominal, pretax and post-trade tax), primarily because of declines in the risk-free rate (see Exhibit 5). This RoE, which will be applied for the entire fourth RP to the RAB assets as of year-end 2023, is under appeal, but we do not expect significant upside for the grid operators.

For new grid investments accruing to the RAB from 2024 through the end of the fourth RP, BNetzA published a proposal in June 2023 (see our Sector Comment for details) to amend the RoE to reflect the increase in interest rates. In January 2024, BNetzA published the final decree with only minor changes to the original proposal. At that time, the regulator also released a preliminary calculation of the RoE for 2024 based on the new approach (see Exhibit 5).

Exhibit 5
Evolution of allowed equity returns in Germany for electricity and gas grids

	1st Period (2009-2013)	2nd Period (2014-2018)	3rd Period (2019-2023)	4th Period BNetzA Final Determination October 2021 (2024-2028)	BNetzA Calculation January 2024
Risk-free rate	**4.23%**	**3.80%**	**2.49%**	**0.74%**	**2.50%**
Market risk premium	4.55%	5.44%	3.80%	3.70%	3.70%
Equity beta	0.79	0.66	0.83	0.81	0.81
Equity risk premium	3.59%	3.59%	3.15%	3.00%	3.00%
Risk surcharge				0.40%	
Cost of equity (post tax) - new assets	7.82%	7.39%	5.64%	4.13%	5.50%
Cost of equity (pre-tax) - new assets	**9.29%**	**9.05%**	**6.91%**	**5.07%**	**6.74%**
Inflation factor	1.45%	1.56%	1.46%	1.27%	
Cost of equity (pre-tax) - old assets	**7.56%**	**7.14%**	**5.12%**	**3.51%**	

Under the German regime, the cost of equity allowance differs for assets acquired or built before 2006 (old assets) and after 2006 (new assets). Old assets receive a real equity return adjusted for inflation and new assets receive a nominal return.
Sources: Bundesnetzagentur and Moody's Ratings

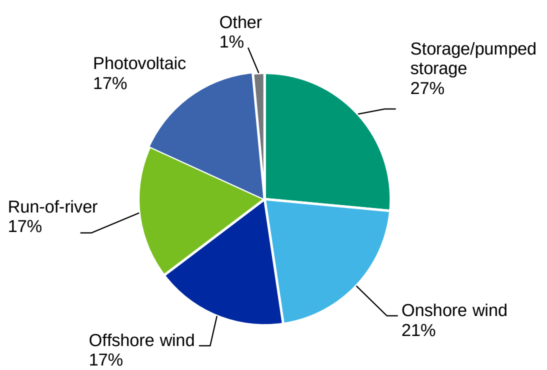
The relatively stable and predictable cash flow from regulated network activities underpins EnBW's plans for around €24 billion in gross capital spending in the SCI segment over 2024-30. This includes spending on electricity grids to connect renewables, digitise the grids and build regional sections of large north-south and cross-country direct-current (DC) connections: SuedLink and NordwestLink (both between TransnetBW and Tennet Holding B.V. [A3 stable]), ULTRANET (TransnetBW partnering with Amprion GmbH [Baa1 stable]) and SuedwestLink (TransnetBW together with 50Hertz GmbH, the 100% subsidiary of Eurogrid GmbH [Baa2 stable]).

Assuming an annual average of €3.5 billion in capital spending, based on EnBW's plans, and equity returns of around 7% on 40% of this amount (BNetzA notional equity share), average annual incremental cash earnings from new investments are around €100 million over the next few years. We expect the annual EBITDA contribution from the SCI segment, on average, to be €2.0 billion-€2.5 billion, taking into account the volatility in energy prices and the regulatory account movements. The segment's operating cash flow will likely not cover its capital spending through the end of the decade.

Sustainable Generation Infrastructure (SGI) - Renewable Energies: Capacity expansion will bring revenue and earnings growth

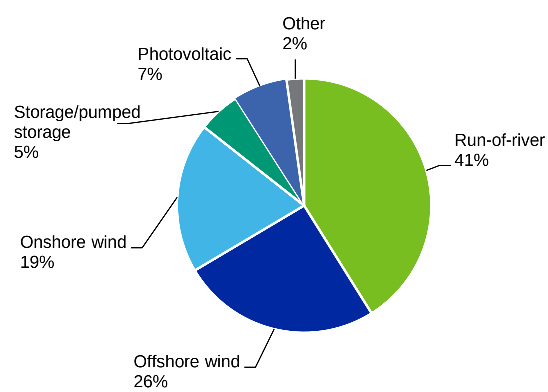
EnBW has a large and well-diversified portfolio of RES, with an installed capacity of around 6.5 gigawatts (GW) as of 30 June 2024, including 3.0 GW of hydro generation assets (run-of-river and pumped storage including thermal capacity); 1.0 GW of offshore wind; 2.4 GW of onshore wind and solar in roughly equal parts; and 0.1 GW of other RES. Through 2030, the company aims to have 10 GW-11.5 GW in RES installed, representing 75%-80% of its total generation capacity, up from 55% as of 30 June 2024. Around 90% of the total installed capacity for RES is located in Germany, with the remainder in France, Sweden and the Czech Republic.[4]

Exhibit 6
EnBW has a diversified portfolio of renewables
Installed capacity (2023)



Total capacity: 5.7 GW.
Sources: Company filings and Moody's Ratings

Exhibit 7
Hydro accounts for the bulk of renewables generation
Output (2023)



Total generation: 12.7 terawatt hours (TWh).
Sources: Company filings and Moody's Ratings

Offshore wind capacity will be the largest driver for RES growth through 2030
Offshore wind, with EnBW's 5 GW[5] pipeline, is key to achieving the company's 2030 RES capacity target:

» He Dreiht (German North Sea): Installed capacity of 960 megawatt (MW), commissioning planned for 2025. In line with its four existing operational offshore farms, EnBW retains a 50.1% majority ownership[6], with the remainder held by various infrastructure investors; no subsidies.

» Dreekant (German North Sea): Potential capacity of 1 GW; EnBW won the rights to develop the wind park in a recent offshore auction at a price of €1,065 million. Of this amount, 90% is to be paid over the operational life of the wind farm, which could commence around 2031; no subsidies.

» Morgan and Mona (UK - England): Combined capacity of 3 GW; final investment decision (FID) yet to be taken; remuneration through contracts-for-difference (CfDs) to be awarded through an auction or PPAs, or a combination of both. If built, the two offshore wind farms could, subject to grid connection, become operational from 2029/30.

» Morven (UK - Scotland): Capacity of 2.9 GW, which could become operational by 2035 if FID is taken; earnings based on CfD or PPAs, or both.

The UK projects were allocated to EnBW and its partner BP p.l.c (A1 stable) through successful bids at seabed lease auctions. We expect EnBW and BP p.l.c to decide on an FID over the next 12-18 months.

He Dreiht is the first offshore wind project in Germany without subsidies, thus its earnings base largely consists of 15-year PPAs with large German corporates. These PPAs reduce the project's merchant exposure but bring counterparty risk and do not offer the same predictability as a fixed-tariff subsidy regime. Although we estimate that more than 50% of the installed capacity has been sold through PPAs, the project is likely to retain a share of merchant exposure with associated risk from output and power price volatility, mitigated by feed-in priority.

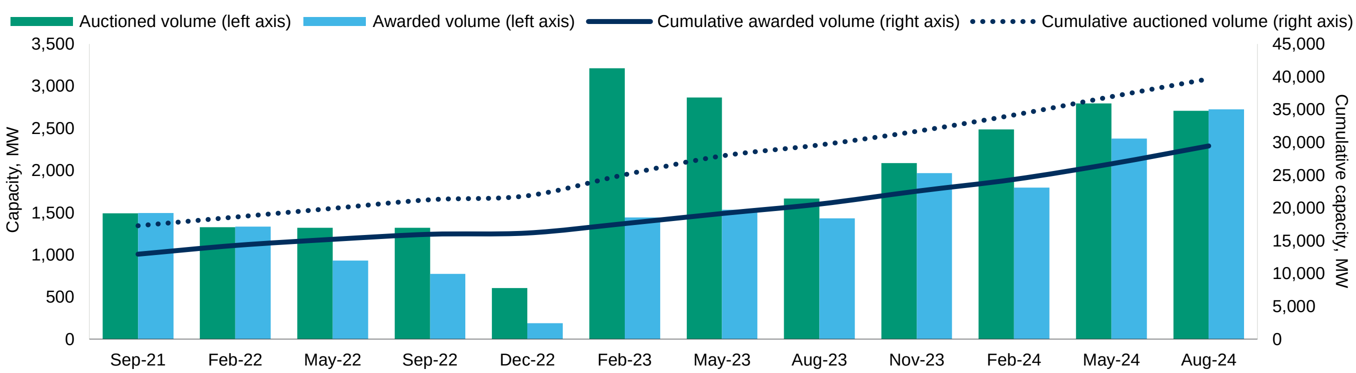
Large-scale solar and onshore wind could add around 2 GW-3 GW capacity by 2030

EnBW has some 1.2 GW of installed onshore wind capacity, with 230 MW under construction. Future growth is focused on Germany but is predicated on support payments to ensure profitability. After a long period of undersubscribed German auctions, the most recent August auction volume was fully allocated at an average price of €73.30/MWh, close to the cap of €73.50/MWh. We expect accelerated permitting procedures and adequate reference prices, which are set annually by BNetzA, to encourage an increase in investment in this technology. This may add around 500 MW to EnBW's portfolio by 2030.

Exhibit 8

Onshore wind auctions in Germany have been undersubscribed for a long time, with 4.1 GW capacity planned for the November 2024 auction

Auctioned and awarded capacity in German onshore wind auctions (September 2021 - August 2024)



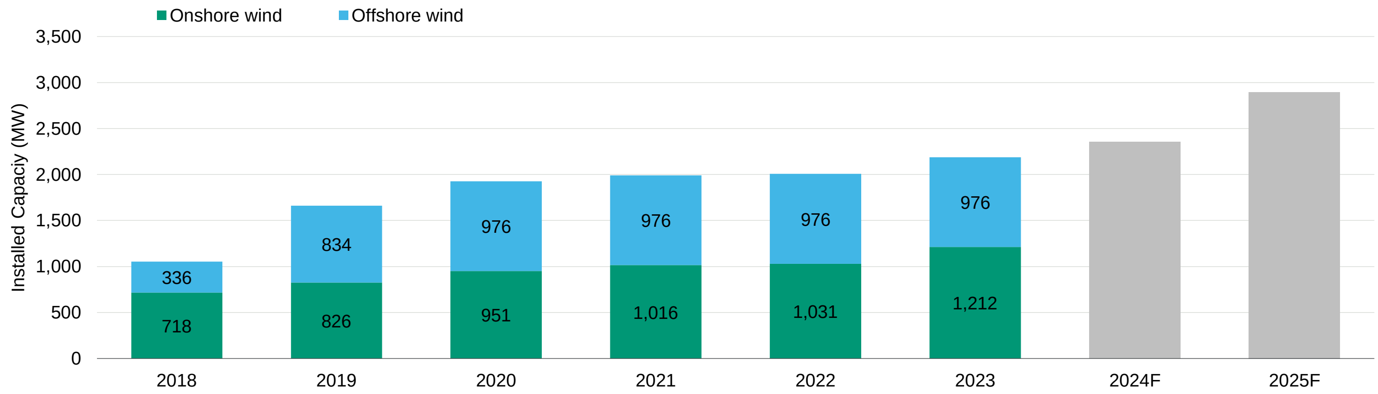
The auctioned volume generally follows values laid out in the Renewables Act (§28 EEG 2023) but can be adjusted, for example, if an auction is likely to be undersubscribed.
Sources: Bundesnetzagentur and Moody's Ratings

EnBW currently has around 1 GW large solar installations in operation and nearly 400 MW under construction, mainly in Germany and Sweden. On a large scale, this technology has reached profitability on merchant terms, because of less cumbersome permitting procedures and a decline in equipment costs. Unless supply-chain bottlenecks arise from geopolitical and trade tensions with China (A1 negative), the world's largest producer of solar panels, we expect significant growth in capacity in Germany and Europe, and EnBW could even triple its capacity by 2030.

Exhibit 9

EnBW's onshore and offshore wind capacity has increased steadily and will be boosted in 2025 by the commissioning of He Dreiht

Onshore and offshore wind capacity (MW)

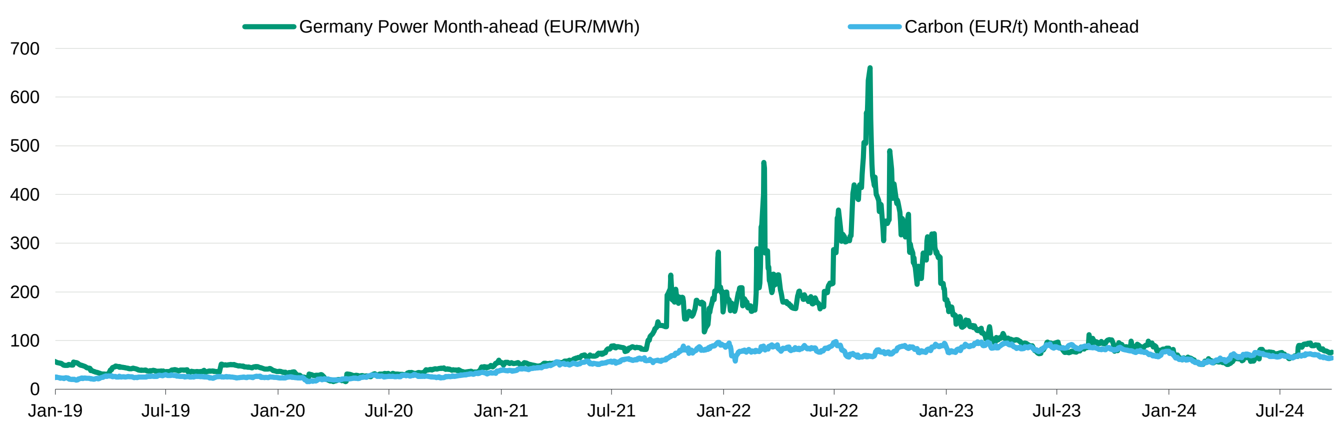


Periods are financial year-end unless indicated.
Sources: Company filings and Moody's Ratings

For 2024, EnBW provided EBITDA guidance of €1.3 billion for RES, below the level in 2023 (€1.7 billion, after including pumped-storage capacity also for the thermal part; previously around €1.1 billion), driven mainly by reduced prices. As of the first half of 2024, which ended in June, earnings from RES amounted to about €600 million, signifying that the company is on track to achieve its guidance, supported by some new capacity and good wind yields. For 2025, we expect moderate EBITDA growth over 2024, subject to resource risk, when additional onshore wind and solar capacity and He Dreiht come online but slightly dampened by merchant exposure to lower prices (EEX CAL-25 futures currently stand at around €85-€90/MWh).

Exhibit 10

After 2022 German electricity prices have decreased significantly on the back of reduced gas prices and relatively stable CO2 prices



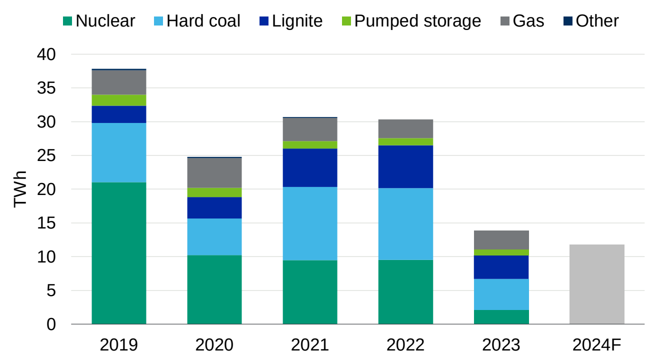
Source: FactSet

SGI - Thermal Generation and Energy Trading: Switch from coal plants to gas-fired capacity will enable further earnings from flexibility offerings

As of 30 June 2024, EnBW (co-)owned and operated a diversified conventional generation fleet with an installed capacity of around 5.6 GW (following allocation of pumped-storage capacity, which was formerly part of thermal capacity, to RES), including around 4.1 GW of coal and lignite plants and nearly 1.2 GW of gas-fired capacity. EnBW's last nuclear plant was closed as planned in mid-April 2023.

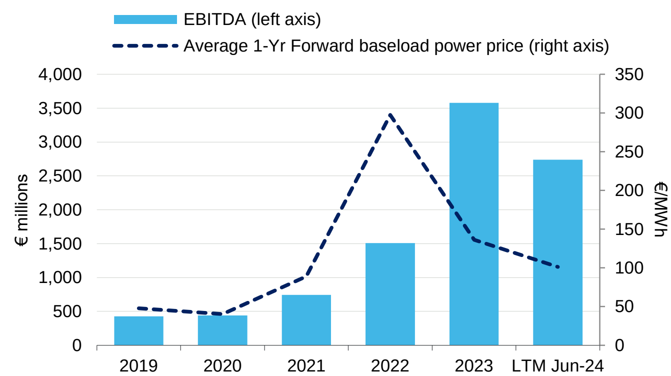
We estimate that conventional generation output will decline in 2024 compared with that in 2023 because of the closure of around 900 MW of coal capacity this year; lower gas and power prices; the absence of nuclear output; and a high share of RES output in Germany, underpinned by rapidly growing solar capacity and good wind yields. However, high prices locked in through hedging in earlier years should lead to an EBITDA contribution of €1.3 billion-€1.8 billion from Thermal Generation and Energy Trading in 2024, down from €3.6 billion in 2023.

Exhibit 11
Conventional generation output in 2024 likely to be below year-earlier level because of nuclear exit in 2023 and high RES output in 2024
Output in TWh



Periods are financial year-end unless indicated.
Sources: Company filings and Moody's Ratings

Exhibit 12
Because of EnBW's hedging of generation, EBITDA development follows electricity prices with a time lag
EBITDA in € millions, average one-year forward price in €/MWh



Adjusted EBITDA Thermal Generation and Trading.
Periods are financial year-end unless indicated. LTM = Last 12 months.
Sources: Company filings, FactSet and Moody's Ratings

Following EnBW's announcement to phase out coal by 2028, which supports its 2035 climate neutrality target, we expect a shift in the nature of conventional earnings over the next four to five years with increasing income from flexibility offerings. These products, including capacity from gas-fired plants and batteries but also demand-side response, are becoming increasingly important with the need to ensure system stability against the backdrop of intermittent RES covering an ever-growing share of electricity supply.

EnBW operates several grid-reserve power plants in Germany with a total capacity of 1.7 GW, which are called upon by the responsible TSO as needed and which are remunerated to recover the mostly fixed costs associated with availability and maintenance as well as output-related expenses. Most of the rest of the current coal fleet is also likely to become grid reserve plants, whereas three plants[7]. will be turned into low-carbon, gas-fired plants that participate in the wholesale market and also generate income from district heating.

Although this shift in conventional generation towards quasi-regulated earnings from system services and reduced exposure to energy wholesale markets is generally credit positive, the concurrent increase in the share of RES in the capacity mix comes with resource risk (see our Sector In-Depth report).

Smart Infrastructure for Customers (SMINC): EBITDA in 2024 depressed by one-off expenses for the replacement of home battery systems

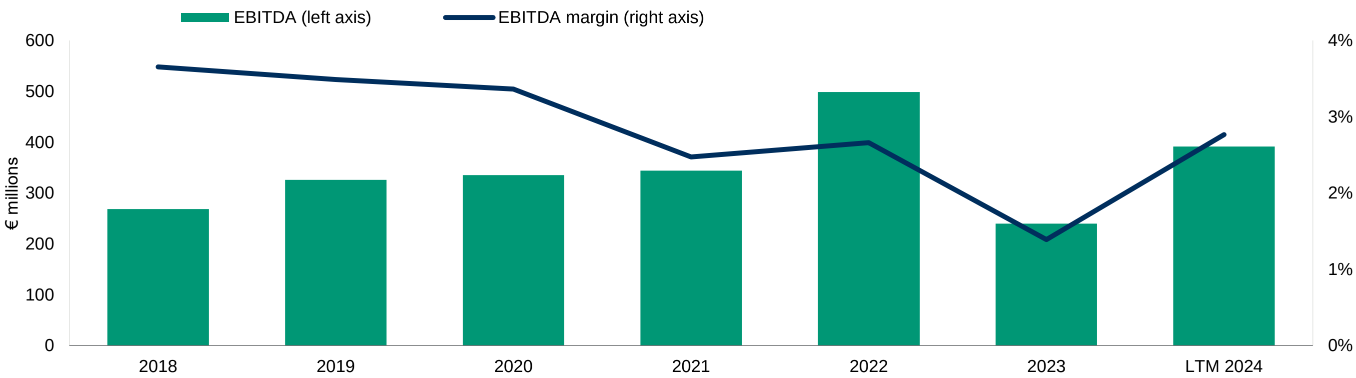
The SMINC segment comprises energy sales to around 5.5 million household and commercial end customers; activities in the fields of new energy solutions (e-mobility, residential solar generation and storage, and biomethane); telecommunications (fiber broadband); and energy-related services for smaller utilities.

Although the segment provides some earnings diversification for EnBW, most of SMINC's EBITDA will continue to be generated from gas and electricity sales. Thus, it remains exposed to electricity and gas wholesale prices and to customer churn on the back of an increase in energy prices, mitigated by the company's regional roots and strong brand recognition.

Exhibit 13

SMINC's cost base is largely commodity price-driven, thus EBITDA growth does not necessarily correlate with increased margins

EBITDA and EBITDA margin in the SMINC segment



Periods are financial year-end unless indicated.
Sources: Company filings and Moody's Ratings

SMINC activities contributed around €240 million to EnBW's EBITDA in 2023. However, its contribution was subdued by the insolvency of the German biomethane trader bmp, an indirect EnBW subsidiary, which resulted in a negative earnings effect of €246 million. bmp was transferred to EnBW's 80% subsidiary VNG AG, a gas company, following the conclusion of the insolvency proceedings.

The SMINC segment is likely to experience volume growth, especially in EV charging and broadband rollouts. However, ramp-up costs, including staff and IT expenses, and the fact that competitors follow similar strategies will limit EBITDA growth potential over the next few years. For 2024, we expect EnBW's EBITDA to fall within its guidance range of €250 million-€350 million, benefiting from the absence of bmp effects in the year earlier but strained by expenses associated with its subsidiary SENEC, a provider of solar and battery-storage solutions for retail clients, which had to replace faulty battery systems. In 2025, we expect the segment to achieve EBITDA of €400 million-€500 million.

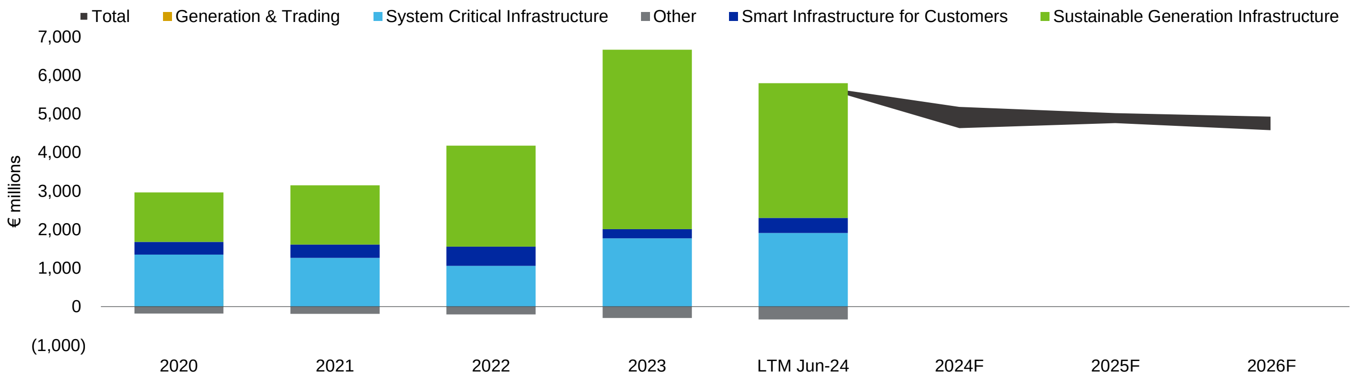
Credit metrics likely to weaken through 2026 compared with 2023 as hedges roll off and investments grow, despite potential mitigation from a capital increase and disposals

Following a record year in 2023 when EnBW achieved adjusted EBITDA (as defined by the company) of €6.4 billion — significantly buoyed by high energy prices from 2022 and early 2023, which were locked in through hedging — the company set its guidance for 2024 between €4.6 billion and €5.2 billion, reflecting the decline in prices and gradual run-off of the hedges. Mainly In view of the lower spot prices observed so far in 2024, which are at most at the level of 2023, we expect adjusted EBITDA within the lower half of the 2024 guidance band. Through 2026, we expect EBITDA to grow moderately to around €5.0 billion, mainly driven by incremental output from higher grid and RES capacities.

Exhibit 14

Favourable generation hedges boosted EnBW's earnings in 2023 to a level unlikely to be achieved again through 2026

Adjusted EBITDA breakdown, in € millions

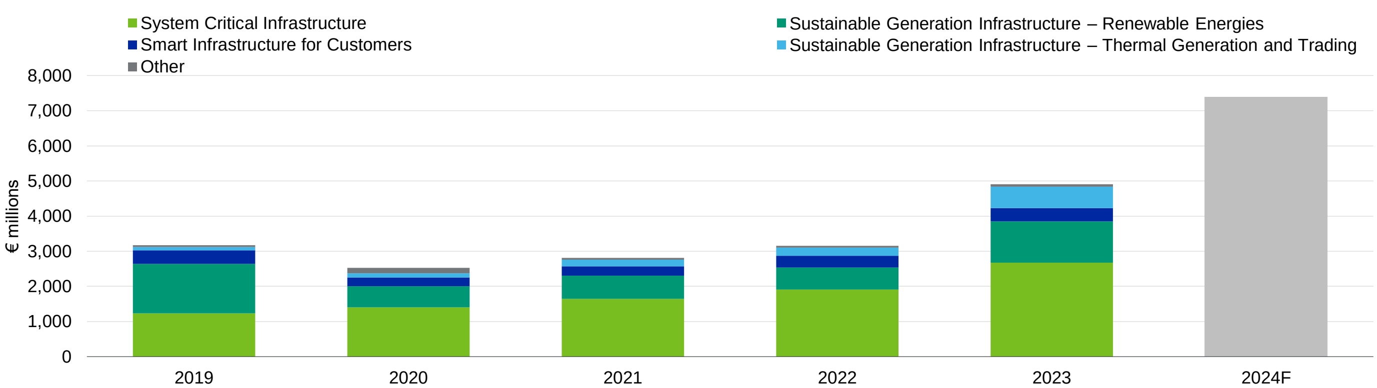


For 2020, Sustainable Generation Infrastructure combines the former Renewable Energies and Generation & Trading segment.
Periods are financial year-end unless indicated. LTM = Last 12 months.
Moody's forecasts are Moody's opinion and do not represent the views of the issuer.
Sources: Company filings and Moody's Ratings forecasts

Assuming annual interest expense of around €450 million-€500 million and dividends of around €800 million, among others, and an average add-back of around €350 million-€400 million for the utilisation of nuclear provisions, we expect annual FFO in the range of €3.5 billion-€3.8 billion and RCF to be around €800 million lower than FFO in 2024-26. Given that gross investments through 2030 will likely be somewhat front-loaded on account of Suedlink and Ultranet, we estimate annual outlays, on average, to be €8 billion over 2024-26, implying negative free cash flow and the need for debt take-up.

Exhibit 15

Gross investments are mainly directed towards networks



Periods are financial year-end unless indicated.
Sources: Company filings and Moody's Ratings

The need for additional borrowing will be partly offset by divestments and could also be reduced through a mooted capital increase of €3 billion in 2025. In September 2024, EnBW's main shareholders Land of Baden-Wuerttemberg and OEW (93.5% ownership in total) publicly declared their willingness to support additional gross investments of €10 billion for the energy transition, with the Land's government explicitly indicating its willingness to inject new equity. Thus, such support is very likely and may result in a temporary strengthening of the credit metrics in 2025.

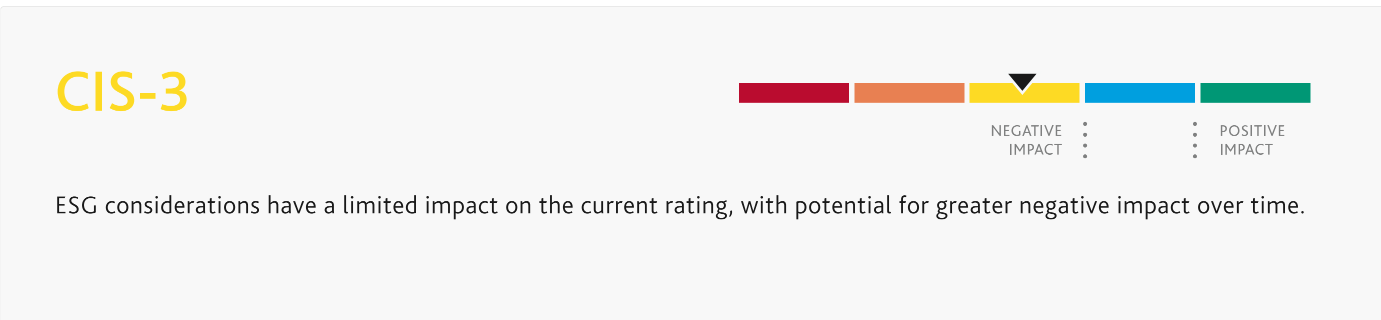
Divestments could include new partnerships through the disposal of minority stakes in existing or new operations. Precedents include the four German offshore wind farms operated by EnBW and TransnetBW. Although such disposals, which are difficult to quantify, would diminish the need for new debt and thus be supportive for the company's credit metrics in the short term, they introduce a risk of cash leakage over the medium term; are likely to weaken the business risk profile, as disposals of lower-risk or contracted businesses are more probable; and add a degree of complexity to the corporate structure, all of which are credit negatives.

Through 2026, we expect credit metrics to weaken (see Exhibit 1) as hedges for generation sold forward at high prices roll off and investment volume increases, but we expect EnBW to remain above our guidance for the current rating as we trust the company to pursue a financial policy to protect its current credit quality and also expect shareholders to pursue a measured dividend policy aligned with EnBW's investments needs.

ESG considerations

EnBW Energie Baden-Wuerttemberg AG's ESG credit impact score is CIS-3

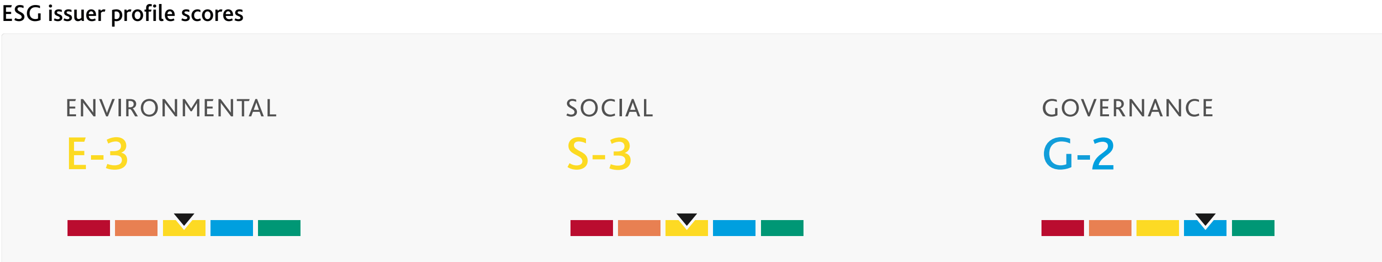
Exhibit 16
ESG credit impact score



Source: Moody's Ratings

EnBW is **CIS-3**, indicating that its ESG attributes are overall considered as having a limited impact on the current rating, with greater potential for future negative impact over time. The CIS-scoring reflects moderately negative environmental and social risks, partly offset by low to neutral governance risks.

Exhibit 17
ESG issuer profile scores



Source: Moody's Ratings

Environmental

EnBW is **E-3**, reflecting the company's carbon transition risks associated with its German coal operations, which the company announced to phase out by 2028. It also incorporates a degree of physical climate risks where the company's network operations (28% of 2023 reported adjusted EBITDA) could get damaged in case of flooding. The score also incorporates the company's liabilities associated with nuclear waste, although this is mitigated by a dedicated assets portfolio, thereby limiting operating cash outflows. Lastly, the score also reflects the sizable investment programme associated with the energy transition.

Social

EnBW is **S-3**, reflecting the risk that demographics and societal trends could lead to public concerns over affordability. These pressures can trigger adverse political intervention as shown in the temporary introduction of an excess revenue tax for utilities in 2022/23. Similarly, the mandate of the national grid regulator to protect end-users from high fees exposes the company to the risk of adverse decisions. Together, EnBW's networks and retail operations represented 32% of reported adjusted EBITDA in 2023.

Governance

EnBW is **G-2**, reflecting the benefit from the ownership by the Land of Baden-Wuerttemberg, which holds 46.75% of the shares. As a government-owned company, we assess that the independence of EnBW's board is relatively weak and that its management may face competing priorities. In addition, EnBW's organisational structure is marked by a gradual increase of subsidiaries with large minority stakes, notably for larger renewable projects, but also at TransnetBW, a key subsidiary in charge of electricity transmission in southwest Germany. Nonetheless, governance risks are balanced by other considerations associated with government ownership, including transparent reporting and oversight as well as a solid track record of achieving financial budgets.

ESG Issuer Profile Scores and Credit Impact Scores for the rated entity/transaction are available on Moodys.com. In order to view the latest scores, please click here to go to the landing page for the entity/transaction on MDC and view the ESG Scores section.

Government support considerations

EnBW is 46.75% owned by the Land of Baden-Wuerttemberg, one of the most prosperous states in Germany. Because of the high ownership, we consider EnBW a GRI.

EnBW's focus on its home region implies a moderate default dependence on the Land of Baden-Wuerttemberg. Our assumption of a moderate probability of support by Baden-Wuerttemberg in case of financial distress at EnBW is underpinned by the company's strategic importance to the region and the shareholder's endorsement of EnBW's strategy. However, it also acknowledges that Baden-Wuerttemberg does not own a majority in EnBW, which may limit a timely intervention.

Liquidity analysis

We expect EnBW to maintain good liquidity over the next 12 months, supported by operating cash flow and cash on balance sheet, and undrawn amounts under committed bank facilities.

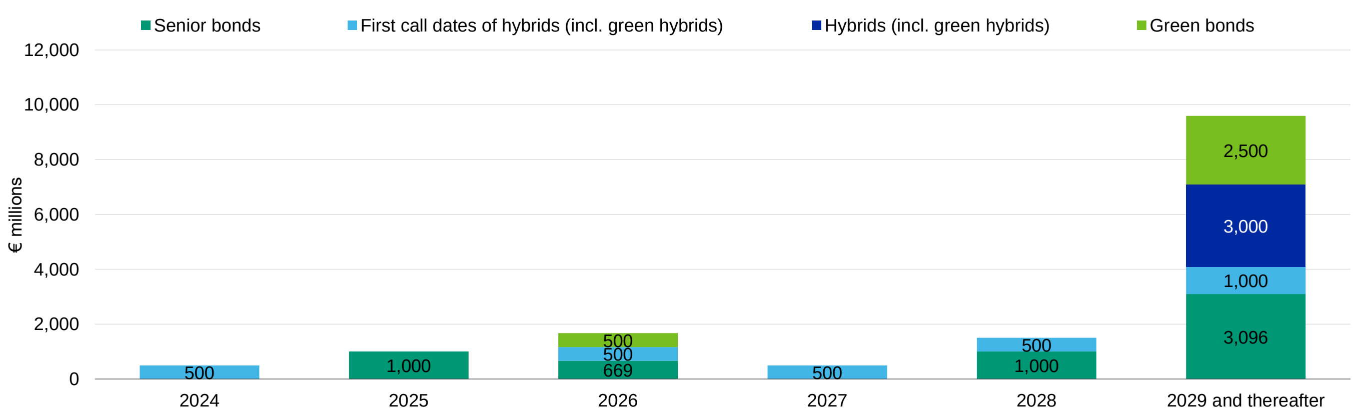
As of the end of June 2024, EnBW had cash and short-term investments (excluding trapped cash) of around €4.2 billion. In addition, the group has around €5.9 billion of committed bank facilities at their disposal, including a €2.0 billion undrawn syndicated facility due in 2029. In July 2024, the company raised €1.2 billion in cash through a successful green bond issuance.

Assuming net investments of around €5.0 billion-€5.5 billion over the next 12 months, debt repayments in January 2025 and April 2025 totalling €1 billion and dividend payments of €700 million-€800 million in 2025, we deem EnBW's available liquidity to be sufficient to cover these outflows.

Exhibit 18

EnBW has a well-spread debt maturity profile

Notes outstanding as of 30 June 2024, in € millions



Periods are financial year-end unless indicated.
Sources: Company filings and Moody's Ratings

Structural considerations

EnBW's capital structure includes a mix of senior unsecured bonds, bank debt and hybrid securities that are largely located at the level of the parent company we rate or the dedicated funding subsidiary EnBW International Finance B.V., which is the issuer of senior bonds and fully guaranteed by the parent. We estimate that around 10%-15% of debt, including leases, sits at the level of subsidiaries over which EnBW has control as sole or majority shareholder. Therefore, we do not apply notching.

EnBW has six hybrids outstanding, amounting to €3.0 billion, but the company announced on 15 October 2024 that it would use the first call date of the €500 million hybrid issued in 2019 and repay the bond on 5 November 2024 (2024 maturity shown in exhibit 18). This bond had been refinanced in January 2024, so outstanding hybrids remain at their previous level of €2.5 billion. Because of the features of the hybrids, we treat them as 50% debt and 50% equity in financial leverage calculations.

Methodology and scorecard

EnBW is assessed in accordance with our Unregulated Utilities and Unregulated Power Companies rating methodology, and our Government-Related Issuers Methodology.

Exhibit 19
Rating factors
EnBW Energie Baden-Wuerttemberg AG

Unregulated Utilities and Unregulated Power Companies Industry	Current LTM Jun-24		Moody's 12-18 month forward view	
Factor 1 : Scale (10%)	**Measure**	**Score**	**Measure**	**Score**
a) Scale ($ billions)	Aa	Aa	Aa	Aa
Factor 2 : Business Profile (40%)				
a) Market Diversification	Ba	Ba	Ba	Ba
b) Hedging and Integration Impact on Cash Flow Predictability	A	A	A	A
c) Market Framework & Positioning	Ba	Ba	Ba	Ba
d) Capital Requirements and Operational Performance	Ba	Ba	B	B
e) Business Mix Impact on Cash Flow Predictability	Aaa	Aaa	Aaa	Aaa
Factor 3 : Financial Policy (10%)				
a) Financial Policy	Baa	Baa	Baa	Baa
Factor 4 : Leverage and Coverage (40%)				
a) (CFO Pre-W/C + Interest) / Interest (3 Year Avg)	6.5x	Baa	4.8x - 5.6x	Baa
b) (CFO Pre-W/C) / Net Debt (3 Year Avg)	30.9%	Baa	20% - 23%	Baa
c) RCF / Net Debt (3 Year Avg)	27.3%	A	15% - 18%	Baa
Rating:				
a) Scorecard-Indicated Outcome		Baa1		Baa1
Government-Related Issuer		**Factor**		**Factor**
a) Baseline Credit Assessment		baa2		baa2
b) Government Local Currency Rating		Aaa		Aaa
c) Default Dependence		High		Moderate
d) Support		Moderate		Moderate
e) Actual Rating Assigned		Baa1		Baa1

All figures and ratios are based on adjusted financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.
LTM = Last 12 months.
Moody's forecasts are Moody's opinion and do not represent the views of the issuer.
Sources: Moody's Financial Metrics™ and Moody's Ratings forecasts

Appendix

Exhibit 20

Peer comparison

EnBW Energie Baden-Wuerttemberg AG

	EnBW AG			Vattenfall AB			Iberdrola S.A.			CEZ, a.s.		
	Baa1 Stable			A3 Stable			Baa1 Stable			Baa1 Negative		
(in $ millions)	FY Dec-22	FY Dec-23	LTM Jun-24	FY Dec-22	FY Dec-23	LTM Jun-24	FY Dec-22	FY Dec-23	LTM Jun-24	FY Dec-22	FY Dec-23	LTM Jun-24
Revenue	59,023	48,047	39,783	23,789	27,368	24,468	56,859	53,350	49,443	13,827	15,860	15,042
EBITDA	4,086	6,551	4,407	2,570	4,380	4,824	13,459	15,255	15,820	5,730	5,787	5,699
Total Assets	74,178	71,492	67,247	75,974	58,404	50,110	160,007	165,314	164,551	48,248	36,116	32,138
Total Debt	23,722	29,376	28,258	23,758	18,329	12,920	57,374	61,533	59,702	11,606	9,732	8,895
Net Debt	12,227	13,709	17,181	7,321	12,810	6,761	52,456	58,198	53,922	9,989	9,245	7,114
FFO / Net Debt	27.7%	49.6%	27.9%	51.8%	25.3%	51.7%	20.3%	19.5%	20.8%	55.3%	37.4%	35.4%
RCF / Net Debt	24.0%	46.1%	23.8%	15.7%	21.5%	42.9%	13.8%	10.7%	13.5%	43.9%	-0.1%	-11.2%
(FFO + Interest Expense) / Interest Expense	5.0x	7.2x	5.3x	5.4x	5.4x	6.4x	5.5x	4.6x	4.7x	15.5x	9.4x	9.1x
Debt / Book Capitalization	59.8%	59.7%	57.6%	61.8%	53.1%	40.5%	46.9%	46.9%	45.4%	46.0%	38.3%	38.6%

All figures and ratios are based on adjusted financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.
LTM = Last 12 months.
Source: Moody's Financial Metrics™

Exhibit 21

Moody's-adjusted debt reconciliation

EnBW Energie Baden-Wuerttemberg AG

(in € millions)	2019	2020	2021	2022	2023	LTM Jun-24
As reported debt	**8,890.5**	**10,499.6**	**12,134.9**	**13,803.9**	**17,454.1**	**17,564.9**
Pensions	7,174.5	7,419.1	7,772.5	5,426.0	6,030.8	6,030.8
Hybrid Securities	(1,489.3)	(1,727.7)	(1,737.8)	(1,244.4)	(1,245.6)	(1,500.0)
Non-Standard Adjustments	5,512.8	5,056.5	4,589.7	4,241.4	4,353.9	4,270.5
Moody's-adjusted debt	**20,088.5**	**21,247.5**	**22,759.3**	**22,227.0**	**26,593.2**	**26,366.2**

All figures and ratios are based on adjusted financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.
Periods are financial year-end unless indicated. LTM = Last 12 months. Non-standard adjustments reflect nuclear liabilities.
Source: Moody's Financial Metrics™

Exhibit 22

Overview on select historical Moody's-adjusted financial data

EnBW Energie Baden-Wuerttemberg AG

(in € millions)	2019	2020	2021	2022	2023	LTM Jun-24
INCOME STATEMENT						
Revenue	19,436	19,694	32,148	56,003	44,431	36,778
EBITDA	2,541	2,705	3,010	3,877	6,058	4,074
EBIT	1,054	1,316	1,454	2,257	3,661	2,058
Interest Expense	581	512	489	784	987	1,034
Net income	442	469	697	1,151	1,399	49
BALANCE SHEET						
Net Property Plant and Equipment	18,553	19,991	20,364	22,705	25,430	27,031
Total Assets	43,207	45,965	71,273	69,504	64,719	62,745
Total Debt	20,089	21,248	22,759	22,227	26,593	26,366
Cash & Cash Equivalents	7,210	7,036	11,883	10,771	14,183	10,336
Net Debt	12,878	14,211	10,876	11,456	12,411	16,031
Total Liabilities	37,290	39,410	64,888	59,296	54,165	51,086
CASH FLOW						
Funds from Operations (FFO)	2,113	2,410	2,620	3,168	6,160	4,479
Cash Flow From Operations (CFO)	553	1,272	7,674	1,933	1,029	2,433
Dividends	(354)	(432)	(387)	(420)	(437)	(664)
Retained Cash Flow (RCF)	1,759	1,978	2,233	2,748	5,722	3,815
Capital Expenditures	(1,909)	(2,338)	(2,547)	(2,954)	(4,579)	(5,146)
Free Cash Flow (FCF)	(1,710)	(1,499)	4,739	(1,440)	(3,988)	(3,377)
INTEREST COVERAGE						
(FFO + Interest Expense) / Interest Expense	4.6x	5.7x	6.4x	5.0x	7.2x	5.3x
LEVERAGE						
FFO / Debt	10.5%	11.3%	11.5%	14.3%	23.2%	17.0%
RCF / Debt	8.8%	9.3%	9.8%	12.4%	21.5%	14.5%
Debt / EBITDA	7.9x	7.9x	7.6x	5.7x	4.4x	6.5x
Net Debt / EBITDA	5.1x	5.3x	3.6x	3.0x	2.0x	3.9x

All figures and ratios are based on adjusted financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.
Periods are financial year-end unless indicated. LTM = Last 12 months.
Source: Moody's Financial Metrics™

Ratings

Exhibit 23

Category	Moody's Rating
ENBW ENERGIE BADEN-WUERTTEMBERG AG	
Outlook	Stable
Issuer Rating	Baa1
Senior Unsecured MTN	(P)Baa1
Subordinate	Baa3
Other Short Term -Dom Curr	(P)P-2
ENBW INTERNATIONAL FINANCE B.V.	
Outlook	Stable
Bkd Senior Unsecured	Baa1
Bkd Other Short Term -Dom Curr	(P)P-2

Source: Moody's Ratings

Endnotes

1 In November 2023, 49.9% of the company, valued at €2.05 billion, was sold in equal parts to Suedwest Konsortium Holding GmbH, a group of institutional and corporate investors from Baden-Wuerttemberg, and Expand Netzbetreiber GmbH, a subsidiary of state-owned lender Kreditanstalt fuer Wiederaufbau (Aaa stable).

2 In September 2024, BNetzA released its "KANU 2.0" determination, laying down rules for the depreciation of legacy assets that had accrued to the RAB as of year-end 2023, complementing KANU 1.0 from November 2022 where assets accruing to the RAB from 2024 were addressed. Under certain conditions, KANU 2.0 allows accelerated full depreciation of assets through 2035.

3 The CCA has been applied since the third RP for distribution grid operators and since the start of the fourth RP for transmission system operators.

4 EnBW is also a 50% partner in the Turkish joint venture (JV) Borusan EnBW Enerji, a large operator of wind farms and some hydropower and solar installations. As of 31 December 2023, the total installed capacity of the JV, which EnBW consolidates at equity, amounted to 730 megawatt (MW), which is not included within the 6.5 GW.

5 UK offshore projects are counted pro rata for EnBW's 50% stake; project companies are consolidated at equity.)

6 EnBW has a 50.3% ownership in Wind farm Baltic 1.

7 Coal plants Altbach/Deizisau, Stuttgart-Muenster and Heilbronn block 7, with an aggregate capacity of 1.17 GW, are in the process of being converted to hydrogen-ready gas plants (total capacity of 1.47 GW) through 2026 at an estimated cost of €1.6 billion.

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