

CREDIT OPINION

8 December 2025

Update



Send Your Feedback

RATINGS

Vonovia SE

Domicile	Germany
Long Term Rating	Baa1
Type	LT Issuer Rating - Fgn Curr
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.

Contacts

Ana Luz Silva, CFA +49.69.70730.914
VP-Sr Credit Officer
ana.silva@moodys.com

Christian Hendker, +49.69.70730.735
CFA
Associate Managing Director
christian.hendker@moodys.com

Kilian Eidecker +49.69.86790.2192
Sr Ratings Associate
kilian.eidecker@moodys.com

Vonovia SE

Update to credit analysis

Summary

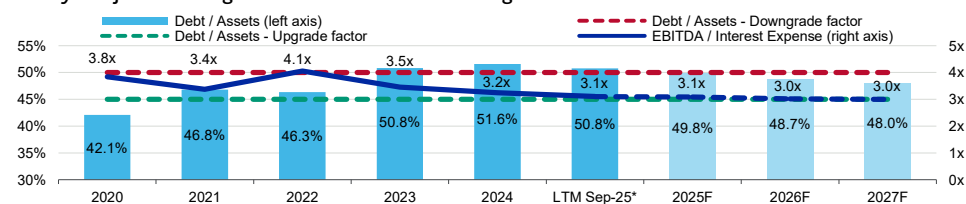
[Vonovia SE's](#) Baa1 rating with a stable outlook is supported by its leading scale and regional diversification in the German multifamily residential market, driving strong operational performance. The structural supply-demand imbalance continues to support solid rental growth and high occupancy. We expect net debt/EBITDA to improve to around 15x (from around 16x as of the end of September 2025) over the next 12-24 months, with rental income remaining the core earnings contributor. Although the company's credit profile is adequately positioned, its Moody's-adjusted debt-to-asset ratio remains at the upper end of our guidance for the rating, at around 50% as of the end of September 2025. We expect this ratio to fall below 50% over the next 12-18 months, supported by gradually recovering valuations and increased property transaction activity. This will enhance strategic flexibility for debt management and leverage reduction.

Our expectation of further leverage reduction is also bolstered by the company's public commitment to reach its financial target of maintaining a reported loan-to-value (LTV) ratio below 45% (45.7% as of the end of September 2025). This is notwithstanding ongoing investments, which are largely self-funded, with 60% of capital sourced internally and supported by recurring sales and non-core disposals, aimed at diversifying and increasing earnings.

Additionally, Vonovia benefits from access to secured debt through a stable domestic banking system, which is a sectorwide credit strength for German multifamily residential issuers. Favourable conditions in unsecured bond markets further enhance refinancing flexibility while preserving its unencumbered asset base. Although rising marginal debt costs — relative to the 1.9% average in-place rate — may gradually strain fixed charge coverage, this is mitigated by solid earnings and a well-staggered, long-dated debt maturity profile (averaging around six years), which should keep interest coverage around 3x over the next 12-18 months.

Exhibit 1

Leverage is set to improve; interest coverage to remain stable Moody's-adjusted debt/gross assets and interest coverage



All data based on adjusted financial data, which follow our Financial Statement Adjustments in the Analysis of Nonfinancial Corporations methodology. LTM = Last 12 months.

*Based on the company's IFRS reporting, Moody's-adjusted debt/assets was 48.2% as of September 2025. 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

Credit strengths

- » Focus on stable and highly regulated residential property rental markets
- » Continued solid operating performance through periods of economic contraction
- » Superior scale and diversity, with an efficiently set up portfolio
- » A well-staggered debt maturity profile and very strong access to debt markets

Credit challenges

- » A Moody's-adjusted debt-to-asset ratio at the upper end of our rating guidance, which we expect to come down over the next 12-18 months
- » Fixed charge cover set to decline unless mitigated by greater earnings growth
- » Sensitivity of the residential sector to social and political considerations, which leaves Vonovia prone to tightening rental regulation and increased investment requirements to address more stringent EU energy and sustainability requirements

Rating outlook

The stable outlook on Vonovia's rating reflects our expectation that the company will maintain credit metrics commensurate with our guidance for the rating, benefiting from an enhanced operating environment for the German multifamily sector, which should support a modest rebound in valuations and property transactions.

Strong market fundamentals such as very low vacancy rates in Germany indicate that rental price growth will continue to accelerate, exacerbated by the significant contraction in the residential construction market. The supportive fundamentals and the regulated nature of the German residential market will provide operating stability even during periods of weak economic growth.

Factors that could lead to an upgrade

- » Vonovia's Moody's-adjusted debt/total assets declines well below 45% and net debt/EBITDA declines well below the midteens in percentage terms, with most of the earnings coming from the stable rental business
- » Its Moody's-adjusted fixed charge cover remains above 3x despite upcoming refinancing activity
- » The company does not increase organisational complexity
- » The regulatory, political and market conditions for the German rental housing sector remain favourable

Factors that could lead to a downgrade

- » Vonovia's Moody's-adjusted debt/total assets remains well above 50% or net debt/EBITDA increases above 17x
- » Its Moody's-adjusted fixed charge coverage declines towards 2.5x
- » The company pursues an aggressive growth strategy
- » Unfavourable changes to property regulation or market conditions in Germany

This publication does not announce a credit rating action. For any credit ratings referenced in this publication, please see the issuer/deal page on <https://ratings.moody.com> for the most updated credit rating action information and rating history.

Key indicators

Exhibit 2

Vonovia SE

(in € billions)	2020	2021	2022	2023	2024	LTM Sep-25	2025F	2026F	2027F
Gross Assets	60.9	103.4	99.8	90.6	88.8	90.3	90.0	91.0	92.4
Unencumbered Assets / Gross Assets	54.2%	52.6%	49.6%	52.2%	44.7%	44.5%	45.0%	45.0%	44.7%
Total Debt + Preferred Stock / Gross Assets	42.1%	46.8%	46.3%	50.8%	51.6%	50.4%	49.8%	48.7%	48.0%
Net Debt / EBITDA	14.3x	23.1x	17.7x	16.9x	16.3x	15.9x	15.8x	15.6x	15.0x
EBITDA / Interest expense	3.8x	3.4x	4.1x	3.5x	3.2x	3.1x	3.1x	3.0x	3.0x

All data based on adjusted financial data, which follow our Financial Statement Adjustments in the Analysis of Nonfinancial Corporations methodology. 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

Exhibit 3

Vonovia SE

	2020	2021	2022	2023	2024	LTM Sep-25	2025F	2026F	2027F
Total Debt + Preferred Stock / Gross Assets (IFRS)	42.1%	46.8%	46.3%	48.7%	49.3%	48.2%	47.6%	46.5%	45.8%
Net Debt / EBITDA (IFRS)	14.3x	23.1x	17.0x	16.2x	15.6x	15.2x	15.0x	14.8x	14.3x

All data based on adjusted financial data, which follow our Financial Statement Adjustments in the Analysis of Nonfinancial Corporations methodology. Moody's-adjusted metrics based on the company's IFRS reporting, that is, not taking into consideration adjustments linked to the minority stakes sold to investment vehicles managed by Apollo.

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

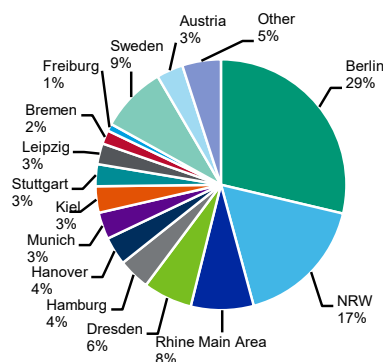
Profile

Vonovia SE is the largest listed residential landlord in Europe, with around 533,000 units in Germany, Sweden and Austria. As of 30 September 2025, the fair value of the company's portfolio was €79.4 billion (including Deutsche Wohnen). Vonovia is a member of the DAX 40 and the EURO STOXX 50, with a market capitalisation of around €22.4 billion as of 27 November 2025. It is the largest European listed property company by balance-sheet assets. The company also manages residential units for third-party owners.

Exhibit 4

Berlin is Vonovia's primary hub

Portfolio breakdown by region, based on fair value as of 30 September 2025



Source: Company reports

Detailed credit considerations

Focus on the stable and regulated rental residential property market

Around 88% of Vonovia's standing portfolio (by value) centres around German residential properties. The German residential sector is one of the most stable asset classes in the European real estate industry, with high demand and limited supply supporting rents and values.

The German rental market is highly regulated, with reletting rents and rent increases for existing tenants capped according to a local index (Mietspiegel), calculated by local authorities based on the location and quality of the units. Rent increases are typically capped at 20% over a three-year period, or 15% in tense markets, with allowances for modernisation capped at 8% annually. In the long term, prices and rents for residential properties in Germany have remained more stable than in other large developed economies, even after taking into account recent increases in market rents, with regulation limiting the company's ability to increase in-place rents.

Average rents across Vonovia's portfolio remain affordable despite recent rent increases. However, affordability fluctuates in tandem with the absolute amount of household income, which exposes lower-income households in particular to higher rental cost-to-income ratios. The sensitivity of the residential sector to social and political considerations leaves Vonovia vulnerable to a potential [tightening of rental regulation](#). This potential for tighter regulation is a risk to property values and cash flow growth, and may exacerbate the supply-demand imbalance.

As of the end of September 2025, Vonovia owned 39,658 units in the Swedish market through its acquisitions of Victoria Park and Hembla. The market is also highly regulated and in high demand, with prolonged undersupply that supports stable rents and values, making new construction unappealing. At present, there is limited risk of regulatory tightening or a shift to market-based rents away from the current utility value-based rents. Rents are typically renegotiated every year between landlords and tenant associations, and have generally increased in line with inflation. If an apartment is refurbished, then a new utility value must be established, which is not part of the annual rent negotiation.

Superior scale and income diversification, with additional business from services and property sales

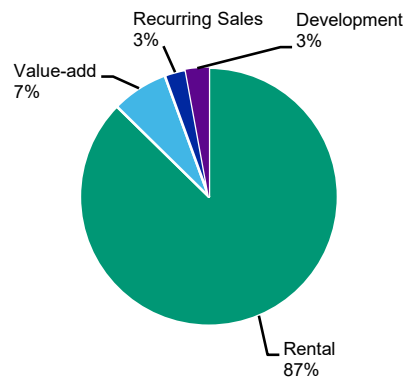
Vonovia is the largest residential landlord in Germany, with a large platform of residential units and substantial income diversification translating into highly predictable revenue and cash generation. Furthermore, the company has operations in Sweden and Austria, both of which are largely regulated rental markets. This increases the benefits of diversification, primarily from a regulatory diversity perspective, rather than in terms of incremental benefits of a more granular income stream.

In recent years, Vonovia has expanded its profit contribution from sources other than rental income and targets a company-adjusted EBITDA contribution from rental income between 75% and 80% (Exhibit 4) while increasing the percentage-based contribution from other segments. The value-added business is closely related to the rental business and influences overall profitability more than external profit. The recurring sales business to private individuals has proven to be a sustainable additional EBITDA contributor for the company, although it is more volatile than the rental business. Within the development business, the development-to-sell business ultimately funds some of the company's own developments to hold (with EBITDA reflecting revaluation gains that are excluded from our EBITDA calculations); however, this business is generally much more volatile than the rental business, and more dependent on economic and funding environment developments. In 2025, the environment strengthened with high sales volumes (46.2% up year on year) and a gross margin of 19% (excluding the first quarter land sale), although it remains volatile throughout the quarters.

Exhibit 5

Most of the EBITDA is derived from the rental segment

Company-adjusted EBITDA breakdown by segment (year-to-date September 2025)



Source: Company reports

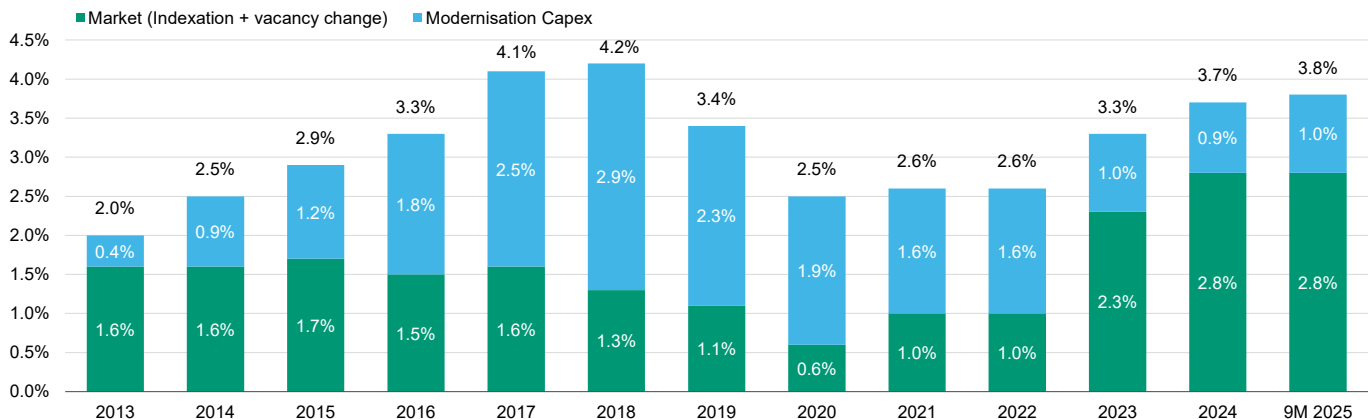
Stable operating performance with low correlation to economic cycles, further supported by investments

Vonovia continues to perform solidly throughout economic cycles, benefiting from its superior scale and regional diversification, illustrated by accelerating rental growth and high occupancy rates. The company reported like-for-like rental growth (excluding new construction) of 3.8% as of the first nine months of 2025 and a very low vacancy of 2.2%. It projects like-for-like rental growth of around 4.1% for full-year 2025, largely driven by rent increases under applicable rent tables, modernisation and new constructions.

Exhibit 6

Vonovia's like-for-like rental growth continues

Rental growth (%) excluding growth from new construction



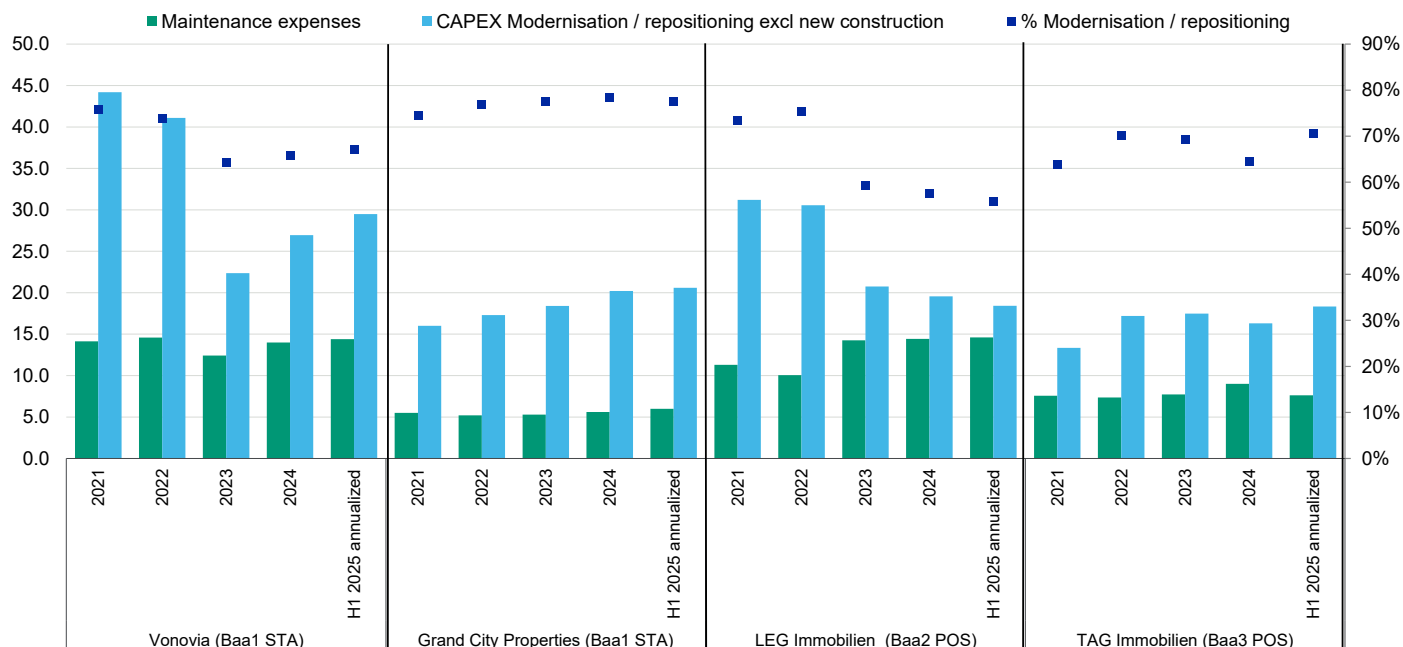
Source: Company reports

Over time, Vonovia has invested more heavily in its assets than some of its peers (outside of space creation and new construction), with the aim to improve the units, especially in terms of energy performance and suitability for elderly tenants. It also reflects the company's strategy to run the refurbishment activities in-house. We expect investments to pick up again as the company resumes its growth trajectory following the achievement of its disposal targets year-to-date.

Exhibit 7

Vonovia's investments per square metre remain above those of peers

Maintenance (expensed and capitalised) and modernisation capital spending



Source: Companies' reports

Although future environmental investment requirements will be high, Vonovia is operationally well positioned as one of the front-runners in investing in its housing stock and improving its energy performance. The company has defined commitments to reduce carbon emissions and is continuing with its refurbishment plan, which includes enhancing the energy performance of its assets.

However, the political aim to improve housing affordability contrasts with the rising investment needs to improve the energy efficiency of the housing stock. If rents cannot be raised in line with the amounts invested in modernisation, the potential yield on future investments will decrease and income-based credit metrics could weaken.

Improved operating environment for the German multifamily sector

We have upgraded the market characteristics score of the [German multifamily residential sector](#) to Aa from A, reflecting its strong long-term fundamentals and defensive profile. Demand for residential property remains high, particularly in metropolitan areas where structural undersupply and limited new construction continue to exert upward pressure on rents. This trend is supported by enduring structural drivers — urbanisation, immigration, shrinking household sizes and broadly stable labour market conditions — which underpin sustained housing demand and contribute to the upward trajectory of rents.

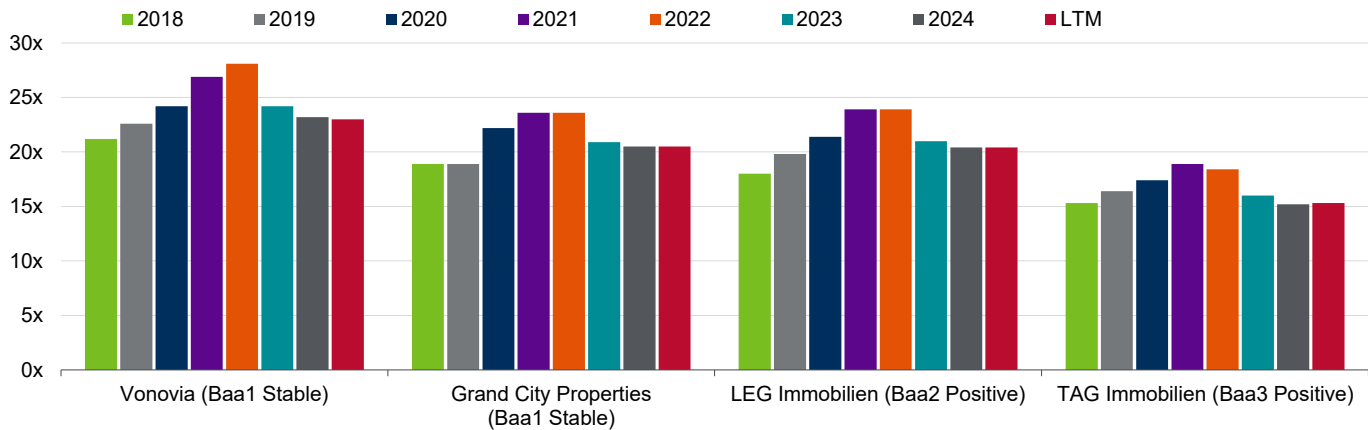
Over the next 12-24 months, the operating environment for residential real estate companies we rate is likely to remain favourable, supported by solid rental growth and high occupancy rates. Rent regulation creates a considerable gap between in-place and market rents, offering positive rent reversion potential. However, this potential cannot be realised immediately because of regulatory constraints. Nonetheless, we expect rental growth across our rated German multifamily residential issuers to reach at least 3% annually, supported by the gradual alignment of in-place rents with updated rent tables and potential additional uplift from modernisation investments. Cash flow stability is further reinforced by consistently high rent collection rates and low tenant churn.

Residential real estate has historically been among the most liquid asset classes in Germany, supported by strong lender appetite. Mortgage banks benefit from access to covered bond markets at affordable terms to refinance German multifamily exposures.

Although investment volumes currently remain below historical averages, we expect a gradual recovery in transaction activity, which should support a modest rebound in valuations. Our rating case remains conservative, assuming low single-digit value growth over the next 12-24 months.

Exhibit 8

German residential in-place rent multiples



LTM data for Vonovia and LEG are as of September 2025 and as of June 2025 for GCP and TAG.

Source: Companies' reports

Leverage to decrease, fixed charge set to remain broadly stable

Following the strong expansion of its portfolio through M&A and investment activities over the last decade, Vonovia's Moody's-adjusted debt/gross assets of around 50.4% as of the end of September 2025 (or based on the company's IFRS reporting, 45.7% as of the end of September 2025) remains at the upper end of our guidance for its rating. We expect the company to adhere to a balanced financial stance that will help reduce leverage in line with its financial targets and to a level more commensurate with a Baa1 rating.

In 2024, Vonovia successfully met its disposal goal of around €3 billion, strengthening its liquidity position and receiving cash proceeds of around €1.4 billion from disposals in the first three months of 2025. The company has announced its intention to resume its organic growth trajectory amid an improved operating environment. We expect the increased level of investments to fund growth initiatives, projected to reach €2 billion by year-end 2028, to be largely self-funded with proceeds from recurring sales, non-core disposals and available cash. The company has identified €1.5 billion in non-core assets as of the end of September 2025 to support its recurring sales volume. Over the next 12-24 months, we expect the company to generate around €2 billion annually from disposal activities.

We also expect a gradual recovery in Vonovia's portfolio valuation, driven by solid rental growth prospects and gradually increasing property transaction activity. In this context, we foresee the Moody's-adjusted debt-to-asset ratio, which includes a €2 billion debt adjustment related to the minority stakes sold to investment vehicles managed by Apollo in 2023, declining gradually towards 48% over the next 12-24 months. In addition, we expect net debt/EBITDA to improve to around 15x from around 16x as of the end of September 2025, with most of the company's earnings continuing to come from its stable rental business.

The interest coverage ratio will remain sensitive to debt costs, which are likely to increase from the 1.9% average cost of debt as of the end of September 2025, as the company partly refinances upcoming maturities. However, the expected solid earnings growth and a well-staggered debt maturity profile will support its interest coverage of around 3x over the next 12-24 months.

Financial integration with Deutsche Wohnen on the back of the DPLTA

In September 2024, Vonovia initiated a DPLTA with Deutsche Wohnen, giving minority shareholders the choice to exchange their shares for Vonovia shares or receive a gross fixed annual payment of €1.22 per Deutsche Wohnen share. Approved in January 2025 and finalized in July, the DPLTA enhances Vonovia's credit profile by allowing it to gain full control and enjoy the benefits of fully integrating Deutsche Wohnen, which currently has moderate leverage, conservative financial practices, and improved liquidity following successful asset disposals.

To implement the DPLTA, Vonovia established a holding company owning around 20% of Deutsche Wohnen's share capital, selling a 51% stake to Apollo for just over €1 billion; the transaction closed in Q3 2025. An important feature is that the structure includes a lock-up agreement, acting as a real estate transfer tax blocker, which requires at least a 10% minority stake to remain permanently

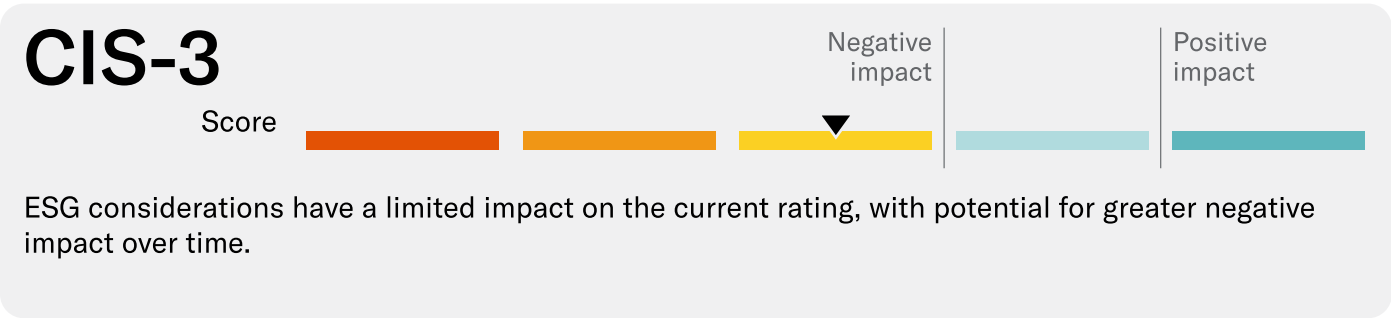
with an external investor—currently Apollo. This arrangement makes a future repurchase of the minority stake by Vonovia highly unlikely due to the loss of significant tax exemption.

The value of guaranteed payments to hold-out minorities in Deutsche Wohnen is reported under IFRS as a liability to non-controlling interests (around €400 million as of Q3 2025). Since this is already captured as a liability and is not material for Vonovia, we have not made any adjustment to debt. However, we qualitatively assess the negative impact on annual cash flow generation, with total compensation payments to hold-out minorities amounting to approximately €100 million per year, including around €70 million distributed to Apollo Management Holdings L.P. However, this is balanced by meaningful cash tax savings.

ESG considerations

Vonovia SE's ESG credit impact score is CIS-3

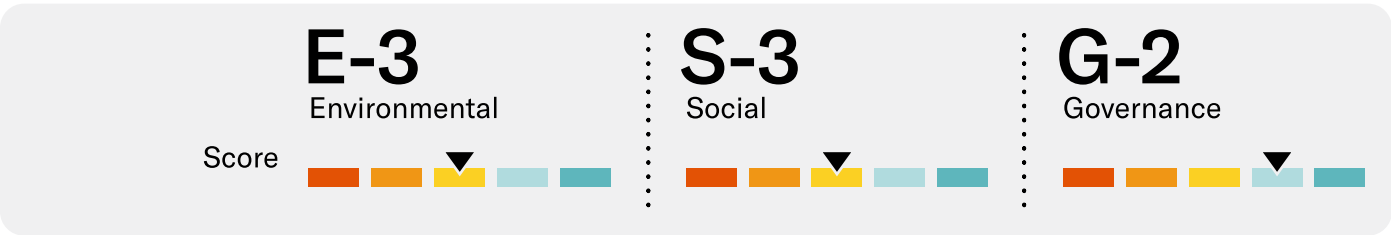
Exhibit 9
ESG credit impact score



Source: Moody's Ratings

The **CIS-3** reflects Vonovia's moderate exposure to carbon transition and regulatory risks, as well as risks from past significant M&A activity that increased leverage. Recent minority disposals have added organizational complexity and cash leakage, but these factors are balanced by Vonovia's continued commitment to its financial targets and the credit-positive integration of Deutsche Wohnen through the DPLTA.

Exhibit 10
ESG issuer profile scores



Source: Moody's Ratings

Environmental

E-3: Vonovia, alongside the German residential sector, has a moderate exposure to carbon transition risk through increasing investment requirements to improve the energy performance of its buildings from a regulatory, investors and tenant perspective. The company has identified a tangible path to net-zero carbon emissions and has been a frontrunner for increasing investments in its assets.

Social

S-3: Vonovia's moderate exposure to social risk arise from affordable living requirements and rental regulation. It affects rental growth potential for companies in the sector and interferes with investment requirements due to environmental regulation. Companies in the sector are also exposed to moderate customer relationship risk through the handling of sensitive private individual data.

Governance

G-2: Vonovia's governance risks arise from its higher leverage compared to similarly rated peers, following past significant M&A activity, and increased organizational complexity and cash leakage from recent minority disposals. These risks are mitigated by Vonovia's strong integration track record, ongoing commitment to financial targets, and the credit-positive implementation of the DPLTA with Deutsche Wohnen.

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.

Liquidity analysis

Solid liquidity but large refinancing needs ahead

Vonovia's liquidity is robust, benefiting from around €3 billion in cash and equivalents as of 30 September 2025, an available €3 billion revolving credit facility (unrated) maturing in July 2030, net proceeds of around €0.5 billion from disposals signed but not yet finalised as of today and an additional €2.25 billion from bond issuances in November 2025. Over the next 12-24 months, we expect the company's liquidity sources to solidly cover interest service, capital spending needs, future dividend distributions and payments to minority shareholders, while also allowing for partial debt repayment.

The company maintains a well-staggered debt maturity profile, with no more than 12% of total debt maturing annually. While this represents a substantial volume given the company's scale, Vonovia has demonstrated best-in-class, reliable access to capital markets, evidenced by record-setting bond issuances, robust investor demand, and the ability to execute transactions even in volatile conditions. Its broad instrument and multi-currency market access, strong banking relationships, and proactive liability management enhance its financial flexibility and underpins our rationale to revise its access-to-capital score upward to Aa from A.

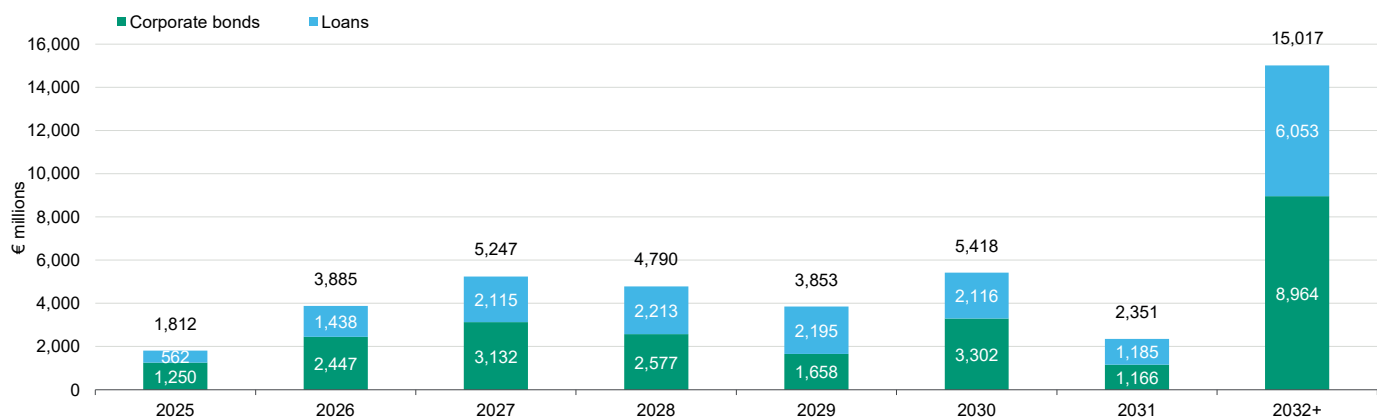
As of 30 September 2025, Vonovia's funding mix was highly diversified, with bonds (including green and social bonds) accounting for 58% of gross debt, complemented by mortgage loans, structured loans, subsidised modernisation debt, and private placements. The weighted average maturity of its debt stood at approximately 5.9 years as of 30 September 2025, underscoring its proactive approach to liability management.

Overall,

Exhibit 11

Vonovia has a well-staggered debt maturity profile

Debt maturities as of 30 September 2025



Source: Company reports

Vonovia maintains sufficient covenant headroom. Although loan covenants vary, the most relevant bond covenants currently are 60% LTV (versus 45.7% reported as of September 2025) and unencumbered assets/unsecured debt exceeding 125% (versus 162% reported as of September 2025).

Methodology and scorecard

The principal methodology used to rate Vonovia was our REITs and Other Commercial Real Estate Firms rating methodology.

Vonovia's long-term issuer rating of Baa1 is one notch above the our scorecard-indicated rating under our current and forward view. The company's superior scale and market position, and focus on stable regulated rental housing activities in core real estate markets like Germany with a robust banking system support the assigned rating. In addition, a further improvement in credit metrics over the next 12 to 18 months is likely.

Exhibit 12

Vonovia SE

REITs and Other Commercial Real Estate Firms Industry Scorecard [1][2]		Current LTM Sep 30 2025	Moody's 12-18 Month Forward View [3]	
	Measure	Score	Measure	Score
Factor 1: Scale (5%)				
a) Gross Assets (USD Billion)	99.4	Aaa	105.0 - 108.0	Aaa
Factor 2: Business Profile (25%)				
a) Asset Quality	A	A	A	A
b) Market Characteristics	Aa	Aa	Aa	Aa
Factor 3: Access To Capital (20%)				
a) Access to Capital	Aa	Aa	Aa	Aa
b) Asset Encumbrance	Ba	Ba	Ba	Ba
Factor 4: Leverage And Coverage (35%)				
a) Debt / Gross Assets	50.4%	Ba	48.0% - 50.0%	Baa
b) Net Debt / EBITDA	15.9x	Ca	15.0x - 16.0x	Ca
c) EBITDA / Interest Expense	3.1x	Baa	3.0x - 3.1x	Baa
Factor 5: Financial Policy (15%)				
a) Financial Policy	Baa	Baa	Baa	Baa
Ratings				
a) Scorecard-Indicated Outcome		Baa2		Baa2
b) Actual Rating Assigned				Baa1

[1] All ratios are based on 'Adjusted' financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.

[2] As of 30 September 2025 (LTM).

[3] This represents Moody's forward view, not the view of the issuer and, unless noted in the text, does not incorporate significant acquisitions and divestitures.

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

Ratings

Exhibit 13

Category	Moody's Rating
VONOVIA SE	
Outlook	Stable
Issuer Rating	Baa1
Senior Unsecured	Baa1
DEUTSCHE WOHNEN SE	
Outlook	Stable
Senior Unsecured -Dom Curr	Baa1

Source: Moody's Ratings

© 2025 Moody's Corporation, Moody's Investors Service, Inc., Moody's Analytics, Inc. and/or their licensors and affiliates (collectively, "MOODY'S"). All rights reserved.

CREDIT RATINGS ISSUED BY MOODY'S CREDIT RATINGS AFFILIATES ARE THEIR CURRENT OPINIONS OF THE RELATIVE FUTURE CREDIT RISK OF ENTITIES, CREDIT COMMITMENTS, OR DEBT OR DEBT-LIKE SECURITIES, AND MATERIALS, PRODUCTS, SERVICES AND INFORMATION PUBLISHED OR OTHERWISE MADE AVAILABLE BY MOODY'S (COLLECTIVELY, "MATERIALS") MAY INCLUDE SUCH CURRENT OPINIONS. MOODY'S DEFINES CREDIT RISK AS THE RISK THAT AN ENTITY MAY NOT MEET ITS CONTRACTUAL FINANCIAL OBLIGATIONS AS THEY COME DUE AND ANY ESTIMATED FINANCIAL LOSS IN THE EVENT OF DEFAULT OR IMPAIRMENT. SEE APPLICABLE MOODY'S RATING SYMBOLS AND DEFINITIONS PUBLICATION FOR INFORMATION ON THE TYPES OF CONTRACTUAL FINANCIAL OBLIGATIONS ADDRESSED BY MOODY'S CREDIT RATINGS. CREDIT RATINGS DO NOT ADDRESS ANY OTHER RISK, INCLUDING BUT NOT LIMITED TO: LIQUIDITY RISK, MARKET VALUE RISK, OR PRICE VOLATILITY. CREDIT RATINGS, NON-CREDIT ASSESSMENTS ("ASSESSMENTS"), AND OTHER OPINIONS INCLUDED IN MOODY'S MATERIALS ARE NOT STATEMENTS OF CURRENT OR HISTORICAL FACT. MOODY'S MATERIALS MAY ALSO INCLUDE QUANTITATIVE MODEL-BASED ESTIMATES OF CREDIT RISK AND RELATED OPINIONS OR COMMENTARY PUBLISHED BY MOODY'S ANALYTICS, INC. AND/OR ITS AFFILIATES. MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND MATERIALS DO NOT CONSTITUTE OR PROVIDE INVESTMENT OR FINANCIAL ADVICE, AND MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND MATERIALS ARE NOT AND DO NOT PROVIDE RECOMMENDATIONS TO PURCHASE, SELL, OR HOLD PARTICULAR SECURITIES. MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND MATERIALS DO NOT COMMENT ON THE SUITABILITY OF AN INVESTMENT FOR ANY PARTICULAR INVESTOR. MOODY'S ISSUES ITS CREDIT RATINGS, ASSESSMENTS AND OTHER OPINIONS AND PUBLISHES OR OTHERWISE MAKES AVAILABLE ITS MATERIALS WITH THE EXPECTATION AND UNDERSTANDING THAT EACH INVESTOR WILL, WITH DUE CARE, MAKE ITS OWN STUDY AND EVALUATION OF EACH SECURITY THAT IS UNDER CONSIDERATION FOR PURCHASE, HOLDING, OR SALE.

MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS, AND MATERIALS ARE NOT INTENDED FOR USE BY RETAIL INVESTORS AND IT WOULD BE RECKLESS AND INAPPROPRIATE FOR RETAIL INVESTORS TO USE MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS OR MATERIALS WHEN MAKING AN INVESTMENT DECISION. IF IN DOUBT YOU SHOULD CONTACT YOUR FINANCIAL OR OTHER PROFESSIONAL ADVISER.

ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY LAW, INCLUDING BUT NOT LIMITED TO, COPYRIGHT LAW, AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT. FOR CLARITY, NO INFORMATION CONTAINED HEREIN MAY BE USED TO DEVELOP, IMPROVE, TRAIN OR RETRAIN ANY SOFTWARE PROGRAM OR DATABASE, INCLUDING, BUT NOT LIMITED TO, FOR ANY ARTIFICIAL INTELLIGENCE, MACHINE LEARNING OR NATURAL LANGUAGE PROCESSING SOFTWARE, ALGORITHM, METHODOLOGY AND/OR MODEL.

MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND MATERIALS ARE NOT INTENDED FOR USE BY ANY PERSON AS A BENCHMARK AS THAT TERM IS DEFINED FOR REGULATORY PURPOSES AND MUST NOT BE USED IN ANY WAY THAT COULD RESULT IN THEM BEING CONSIDERED A BENCHMARK.

All information contained herein is obtained by MOODY'S from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, all information contained herein is provided "AS IS" without warranty of any kind. MOODY'S adopts all necessary measures so that the information it uses in assigning a credit rating is of sufficient quality and from sources MOODY'S considers to be reliable including, when appropriate, independent third-party sources. However, MOODY'S is not an auditor and cannot in every instance independently verify or validate information received in the credit rating process or in preparing its Materials.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability to any person or entity for any indirect, special, consequential, or incidental losses or damages whatsoever arising from or in connection with the information contained herein or the use of or inability to use any such information, even if MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers is advised in advance of the possibility of such losses or damages, including but not limited to: (a) any loss of present or prospective profits or (b) any loss or damage arising where the relevant financial instrument is not the subject of a particular credit rating assigned by MOODY'S.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability for any direct or compensatory losses or damages caused to any person or entity, including but not limited to by any negligence (but excluding fraud, willful misconduct or any other type of liability that, for the avoidance of doubt, by law cannot be excluded) on the part of, or any contingency within or beyond the control of, MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers, arising from or in connection with the information contained herein or the use of or inability to use any such information.

NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY CREDIT RATING, ASSESSMENT, OTHER OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER.

Moody's Investors Service, Inc., a wholly-owned credit rating agency subsidiary of Moody's Corporation ("MCO"), hereby discloses that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by Moody's Investors Service, Inc. have, prior to assignment of any credit rating, agreed to pay Moody's Investors Service, Inc. for credit ratings opinions and services rendered by it. MCO and all MCO entities that issue ratings under the "Moody's Ratings" brand name ("Moody's Ratings"), also maintain policies and procedures to address the independence of Moody's Ratings' credit ratings and credit rating processes. Information regarding certain affiliations that may exist between directors of MCO and rated entities, and between entities who hold credit ratings from Moody's Investors Service, Inc. and have also publicly reported to the SEC an ownership interest in MCO of more than 5%, is posted annually at ir.moody.com under the heading "Investor Relations — Corporate Governance — Charter and Governance Documents - Director and Shareholder Affiliation Policy."

Moody's SF Japan K.K., Moody's Local AR Agente de Calificación de Riesgo S.A., Moody's Local BR Agência de Classificação de Risco LTDA, Moody's Local MX S.A. de C.V., I.C.V., Moody's Local PE Clasificadora de Riesgo S.A., and Moody's Local PA Clasificadora de Riesgo S.A. (collectively, the "Moody's Non-NRSRO CRAs") are all indirectly wholly-owned credit rating agency subsidiaries of MCO. None of the Moody's Non-NRSRO CRAs is a Nationally Recognized Statistical Rating Organization.

Additional terms for Australia only: Any publication into Australia of this document is pursuant to the Australian Financial Services License of MOODY'S affiliate, Moody's Investors Service Pty Limited ABN 61 003 399 657 AFSL 336969 and/or Moody's Analytics Australia Pty Ltd ABN 94 105 136 972 AFSL 383569 (as applicable). This document is intended to be provided only to "wholesale clients" within the meaning of section 761G of the Corporations Act 2001. By continuing to access this document from within Australia, you represent to MOODY'S that you are, or are accessing the document as a representative of, a "wholesale client" and that neither you nor the entity you represent will directly or indirectly disseminate this document or its contents to "retail clients" within the meaning of section 761G of the Corporations Act 2001. MOODY'S credit rating is an opinion as to the creditworthiness of a debt obligation of the issuer, not on the equity securities of the issuer or any form of security that is available to retail investors.

Additional terms for India only: Moody's credit ratings, Assessments, other opinions and Materials are not intended to be and shall not be relied upon or used by any users located in India in relation to securities listed or proposed to be listed on Indian stock exchanges.

Additional terms with respect to Second Party Opinions and Net Zero Assessments (as defined in Moody's Ratings Rating Symbols and Definitions): Please note that neither a Second Party Opinion ("SPO") nor a Net Zero Assessment ("NZA") is a "credit rating". The issuance of SPOs and NZAs is not a regulated activity in many jurisdictions, including Singapore. JAPAN: In Japan, development and provision of SPOs and NZAs fall under the category of "Ancillary Businesses", not "Credit Rating Business", and are not subject to the regulations applicable to "Credit Rating Business" under the Financial Instruments and Exchange Act of Japan and its relevant regulation. PRC: Any SPO: (1) does not constitute a PRC Green Bond Assessment as defined under any relevant PRC laws or regulations; (2) cannot be included in any registration statement, offering circular, prospectus or any other documents submitted to the PRC regulatory authorities or otherwise used to satisfy any PRC regulatory disclosure requirement; and (3) cannot be used within the PRC for any regulatory purpose or for any other purpose which is not permitted under relevant PRC laws or regulations. For the purposes of this disclaimer, "PRC" refers to the mainland of the People's Republic of China, excluding Hong Kong, Macau and Taiwan.

REPORT NUMBER 1467537