DEVELOP-AND-HOLD-STUDY 2021

NEW HOUSING CONSTRUCTION IN AN ERA OF LOW INTEREST RATES AND SOCIAL URBAN DEVELOPMENT

DECEMBER 2021


UBS

EMPIRA

Dear Readers,

Lahcen Knapp
Chairman of the Board of Directors
Empira Group

For the third time in a row, we have worked hand-in-hand with bulwiengesa to precisely examine the develop-and-hold residential project development market in Germany's seven Class-A cities. Our current study confirms the trend we have seen in recent years: The develop-and-hold segment is becoming more and more important.

Currently, 6.2 million m^2 of residential space is being developed in Germany's top seven cities as part of develop-and-hold projects scheduled to be completed by 2025. A year ago, this figure was 5.4 million m^2 (by 2024). The calculated project volume increased from approximately EUR 35 billion to EUR 43 billion. It is therefore apparent that there is significant movement in rental apartment construction. However, it is still not enough to meet demand.

A closer look at the larger-scale projects being developed additionally reveals that in many cities, public-sector or municipal housing companies are still the top dogs, but private-sector developers are increasing in importance. If the aim is to alleviate the housing shortage in the foreseeable future, no hurdles should be placed in their way. This is a clear message to the new federal government – but it is also quite explicitly directed at the new Senate in Berlin.

In the special section of the study this time, we discuss sustainability and the three-letter acronym “ESG,” along with the related requirements, particularly for housing construction and the leasing of existing properties. Johannes Kreißig, CEO of the German Sustainable Building Council (Deutsche Gesellschaft für Nachhaltiges Bauen - DGNB) was kind enough to provide us with an interview in which he explains the current regulatory situation. Read about for yourself!

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Foreword

The study you hold in your hands is the third edition of bulwiengesa's analysis of the develop-and-hold project development market for Empira. In the first edition in mid-2019, we outlined the methodology, the difference between develop-and-sell and develop-and-hold[1] projects, and especially the difficulties sometimes associated with these strategies. We reported for the first time in greater depth about the breakdown of project volumes and actors in the develop-and-hold residential segment.

In the second edition in Q3/2020, we shifted our focus to changes in these structures, which alone was a very interesting topic. Analyzing this issue in the middle of the coronavirus pandemic was an additional challenge. We therefore discussed the expected effects of the COVID-19 crisis on the various segments in an extra section. This, our third edition, now presents the effects of the COVID-19 crisis with greater precision after nearly two years of the pandemic.

Moreover, the present study again covers the structure of the develop-and-hold project space in depth.[2] As has been the case to date, this third edition of the develop-and-hold study concentrates on the interplay between public- and private-sector actors. Our second edition included metrics for a growing number of private-sector companies in the develop-and-hold residential segment in Germany's seven Class-A cities. Now we must determine whether the trend has really gained a firm foothold.

Developments in the past several months have been driven mainly by the COVID-19 pandemic but by other issues as well, including the expropriation discussion in Berlin, increasing regulation in the residential segment, the persistent high level of housing demand in german Class-A cities, and the new German Building Land Mobilization Act (Baulandmobilisierungsgesetz) as well as the ever-present conversations in the market regarding sustainability currently. These present arguments both for and against the idea that the trend in question has taken hold. In the first section, the main part of the study, we analyze and interpret the new metrics accordingly.

In the second section, which covers our focus topic, we explicitly refrain from concentrating on the coronavirus pandemic and instead explore the next major issue facing the real estate industry and therefore the residential project development market: sustainability or ESG (environment, social, corporate governance), as it has become known over time.

Regarding the data, we would also like to point out that this year's study included figures from Q2/2021. The rates of change in project volumes presented here therefore extend slightly beyond a period of one year.

1 For details, see the Glossary.
2 The following are the differences between the bulwiengesa Project Developer Study and the Develop-and-Hold Study by EMPIRA: The analysis in the latter is based on housing units (sometimes estimated) and theoretical market values, while the bulwiengesa Project Developer Study uses residential space as the basis of its analysis. EMPIRA's Develop-and-Hold Study exclusively analyses projects under construction and in the planning stage, while the bulwiengesa Project Developer Study also takes into account some completed projects. However, both studies have the following methodology in common: The analysis concentrates on Germany's seven Class-A cities with a clear demarcation by municipality. Projects are assigned to categories depending on whether developers build them to sell or to hold, according to the methodology of the Project Developer Study. The projects included measure 1,000 m^2 or more.

Chapter 1
The Market for Develop-and-Hold Residential Projects in the seven german Class-A Cities

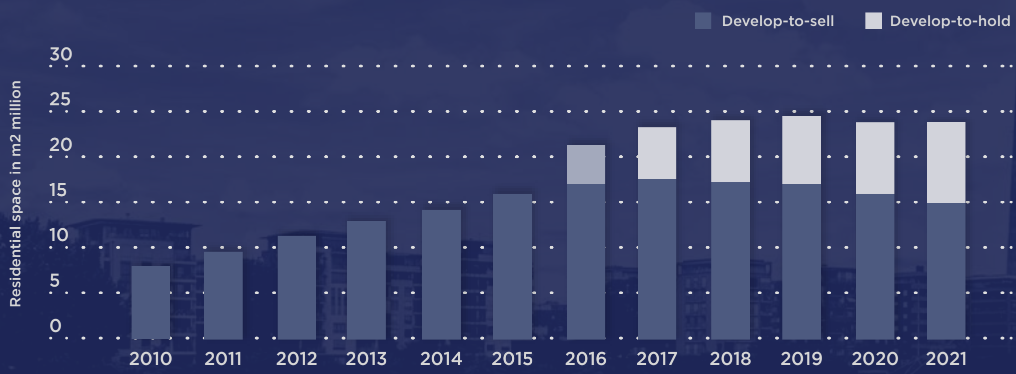
1.1 Notes on COVID-19 and other general conditions

Even before work on the Empira study began, it was evident that the share of residential project development accounted for by develop-and-hold projects was growing in Germany's seven major cities. Public-sector entities with portfolios benefit from easier access to land. On the private-sector side, projects developed for capital investors have come to be considered a value-added product. They increasingly take part in the development process earlier and earlier, so forward deals sometimes become projects where they handle the entire process.

The current COVID crisis has significantly accelerated this trend, particularly in the residential real estate segment. For instance, in the seven german Class-A cities, the share of total residential project space accounted for by develop-and-hold projects rose again despite COVID, both in relative and absolute terms. Without this growth, total residential project space in german Class-A cities in study year 2021, which was marked by the coronavirus pandemic, might have declined substantially, like in so many other segments. However, the strong showing by the develop-and-hold segment allowed the residential segment to remain mostly stable.

Initial assumptions were made on the impact of the COVID-19 crisis on individual real estate

Residential project volume by study year* in all seven Class-A cities



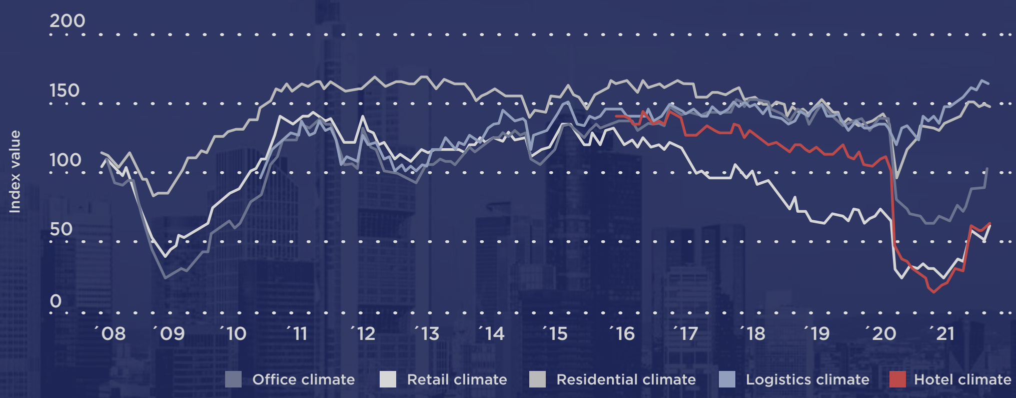
Source: bulwiengesa Project Developer Study 2021, published: May 2021; based on Q1/2021 data, including completed projects.
** Cumulative residential space by study year in the projects (to be) completed from three years before to four years after the study year.*
Note: The investor-development market figures were purely indicative in 2016 and are therefore highlighted in a different color.

segments for the previous study prepared at the start of the pandemic. The fact that these were different for each segment was more than evident even then. The bulwiengesa AG Hypo Real Estate Economy Index now indicates that the residential segment came through the crisis very well, relatively speaking. Uncertainty prevailed for only a short time, and now residential real estate has returned to its pre-pandemic levels, whereas the other segments still trail their early-2020 performance, with the exception of the booming logistics segment.

Our positive expectations for the residential segment from that period were therefore confirmed in many respects. With working from home now an established concept, homes today fulfill an additional function, which increases demand for living space. This is not the only reason the outlook for residential project development in german Class-A cities remains sunny, however. Recently stagnant project development activity in these markets has tightened the supply. And despite the pandemic, the already attractive conditions there, such as growth in the number of households and the average residential space in demand, remain in place.

The initial uptick in uncertainty in the residential real estate market due to the COVID crisis therefore quickly dissipated almost entirely. In view of the fact that "everyone has to live somewhere," residential properties gained significance for institutional investors with a low risk appetite, such as pension plans and insurance companies. Early entry into the value chain remains attractive for these companies, and forward deals are still in demand. For conventional holders of residential real estate portfolios, early entry into the value chain is also important, because it is a way to counteract factors such as a shortage of projects and land available for development. Private-sector companies in particular have supplemented their knowledge base and processes in this context in recent months. A typical example is the takeover of project developer Buwog by Vonovia. Public-sector real estate investors have also expanded their project development capacity.

Real estate climate by segment up to July 2020



Source: bulwiengesa AG Hypo Immobilienklima, as at July 2021.

Of course, there are still trends evident in the market that bring with them uncertainty for residential development projects. New factors of note are the rising inflation rate and the uncertainties regarding the new German Building Land Mobilization Act. The many increasingly complex regulations – rent controls, German Condominium Act (Wohnungseigentumsgesetz - WEG) reform, and others such as the EU's ESG rules – as well as high land prices have been problematic for some time now. Institutional investors also face the threat of flattening growth rates for rents and prices, which is not attributable to COVID. This outlook means that it is even possible that residential real estate multipliers may decline in the next five years.

For this reason and others, the market is currently experiencing consolidation, which is apparent, for instance, in additional takeovers or mergers of residential real estate companies as well as project developers.[3] Observing market developments will continue to remain important as a result. The sections below illustrate how the individual groups of actors and top companies in the develop-and-hold residential segment have performed since the last study[4] and how they now rank.

3 E.g., Vonovia and Deutsche Wohnen, Bauwens and Büschl, Adler and Consus.
4 Develop-and-Hold Study by EMPIRA, November 2020; data from Q2/2020.

1.2 Comparison of the overall market in the seven german Class-A cities

Demand for residential space remains unmet in the seven german Class-A cities

Currently, approximately 6.2 million m² of residential space is being developed in Germany's seven Class-A cities as part of develop-and-hold projects, i.e., projects kept in a developer's portfolio.[5] That equals 1.2 million m² per year. This total figure increased slightly over the previous year (up 155,000 m²). In contrast, the area of projects developed for sale dropped noticeably (by 195,000 m² to around 1.9 million m² per year). A combination of the two strategies will therefore produce 3.1 million m² of residential space per year in the seven german Class-A cities. That is some 40,000 m² less than in the previous analysis and corresponds to about 41,400 housing units per year. The total residential project area therefore remained mostly stable only thanks to the increase in develop-and-hold project space.

In its housing demand forecast for 2020, bulwiengesa projects additional housing demand in the seven german Class-A cities of some 58,000 housing units per year.[6] In addition, this demand is not met quantitatively. In qualitative terms, it can additionally be assumed that significant surplus demand still exists in some segments. This is true particularly in the mid-level to lower rent and price segments.

Notable decline in classic project development

The amount of space being developed for sale therefore continues to decline. After decreasing by 8.5 percent in last year's study, the volume in this year's study dropped by an additional 9.5 percent. It is important to note that this trend applies only to the clearly demarcated territory covered by the seven german Class-A cities. This development should by no means be considered a nationwide trend. Conventional residential project developers continue to remain true to the German residential market, but they pursue residential projects in the german Class-A cities much less frequently, instead shifting their activity to the areas immediately surrounding major housing markets. Corresponding analyses also continue to confirm this trend.[7]

5 Only projects to be completed between 2021 and 2025; projects in the planning stage or under construction, not including completed projects.
6 See Housing Demand Forecast, bulwiengesa AG, spring 2021; annual average replacement/additional demand across all seven Class-A cities from 2021 to 2025.
7 See, e.g., bulwiengesa Project Developer Study 2021, pp. 14–15.

Housing – volume in study year 2021*, by strategy and german Class-A city

	RESIDENTIAL SPACE, ABSOLUTE			RESIDENTIAL SPACE, REL.
	Actual 2021*	Change 2020-2021*	Development type, in %	Actual 2021*
	In m²	Absolute		In m2 per inhabitant
Berlin				
Develop-to-hold	2,745,000	644,000	39 %	0.75
Develop-to-sell	2,913,000	-343,000	61 %	0.80
	5,658,000	**301,000**		**1.55**
Düsseldorf				
Develop-to-hold	336,000	-3,000	24 %	0.54
Develop-to-sell	968,000	-89,000	76 %	1.56
	1,304,000	**-92,000**		**2.11**
Frankfurt/Main				
Develop-to-hold	531,000	-124,000	35 %	0.71
Develop-to-sell	1,185,000	-29,000	65 %	1.57
	1,716,000	**-153,000**		**2.28**
Hamburg				
Develop-to-hold	628,000	-112,000	29 %	0.34
Develop-to-sell	1,506,00	-292,000	71 %	0.82
	2,134,00	**-404,000**		**1.16**
Cologne				
Develop-to-hold	323,000	18,000	26 %	0.30
Develop-to-sell	977,000	105,000	74 %	0.90
	1,300,000	**123,000**		**1.20**
Munich				
Develop-to-hold	1,341,000	250,000	37 %	0.91
Develop-to-sell	1,517,000	-305,000	63 %	1.03
	2,858,000	**-55,000**		**1.94**
Stuttgart				
Develop-to-hold	298,000	105,000	43 %	0.47
Develop-to-sell	239,000	-21,000	57 %	0.38
	537,000	**537,000**		**0.85**
Total				
Develop-to-hold	6,201,000	777,000	35 %	0.62
Develop-to-sell	9,306,000	-974,000	65 %	0.93
	15,507,000	**-197,000**		**1.54**

Cumulative residential space by study year in the projects to be completed up to four years after the study year.

Few changes in city ranking

Purely in terms of total volume, Germany's capital still dominates the market for development projects: Twice as many square meters of residential space are being developed in Berlin than in other cities such as Munich. A look specifically at develop-and-hold projects also puts Berlin well ahead of the other cities; the proportions do not change as a result. Germany's capital has also gained the most develop-and-hold project area: Over 80 percent of the total increase in space (plus 770,000 m²) in this segment was in Berlin (plus 644,000 m²). Also seeing notable growth are Munich (plus 250,000 m²) and Stuttgart (plus 105,000 m²). All other cities experienced stagnation or a downturn in this segment. But Berlin is no longer the star in terms of the ratio of develop-to-hold project volume to inhabitants: By this measure, construction is particularly robust in Frankfurt/Main, Düsseldorf, and Munich.

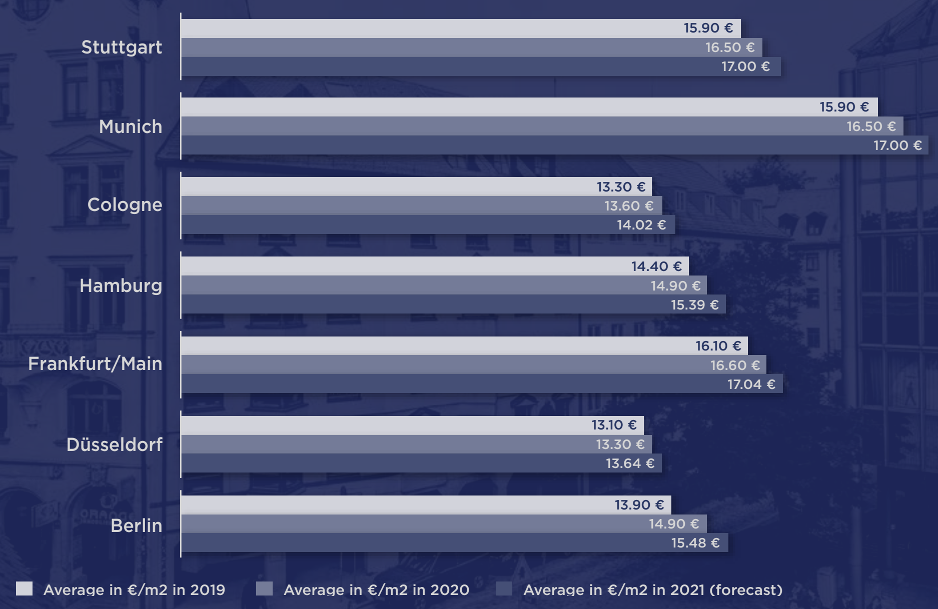
Develop-and-hold segment noticeably gaining importance

In the previous study, residential project volume in the develop-and-hold residential segment remained mostly stable, seeing only slight growth of 0.4 percent. However, growth in this segment is now substantial at over 12 percent. Berlin in particular remains a driver of this development. In the previous analysis, only Frankfurt/Main and Munich experienced growth, albeit marginal, whereas this time, significant growth in space was identified in other cities as well (Munich, Stuttgart).

Theoretical market value grows robustly, by 12 percent

The Develop-and-Hold Study by EMPIRA does not simply view projects by square meters alone. They are additionally analyzed by their residential area and are thus assigned a theoretical market value[8]. In the current study, the theoretical market value of the develop-and-hold residential projects in the seven german Class-A cities amounts to EUR 42.9 billion. That is a healthy 12 percent more than in the previous study. The theoretical market value is influenced on the one hand by changing project volumes. In the develop-and-hold segment, this has increased, as outlined above, and therefore gives rise to an increase in the theoretical market value as well. In Düsseldorf, the project volume was down slightly, but the theoretical market value increased somewhat nonetheless. That is due to the second component making up this value: Each project is assigned a rent and price level based on its residential area. If these change, this also affects the theoretical market value and can even balance out a slight decrease in volume.

Market value calculation for develop-and-hold projects by EMPIRA – average rent for new residential construction from 2019 to 2021



Source: bulwiengesa RIWIS.

8 For details, see the Glossary.

Rent, price, and multiplier outlook improved

Rents in 2020 exceeded the originally cautious forecasts of the previous study in all german Class-A cities. The coronavirus crisis left no mark on rent and price trends in the high-demand housing markets in these cities: Rents continued to rise sharply. Working from home increased the day-to-day importance of people's own homes. Financing terms, which remained positive, additionally bolstered rent and price trends in the residential segment. This and the fundamentally more optimistic mood regarding general economic developments in Germany result in a positive outlook for the coming years. However, growth rates in the rent and price segment are expected to weaken in the future years, however. Multipliers are likely to see a minor downturn from 2022/2023 onward for reasons including potential deterioration in the outlook for rent increases due to regulatory measures.

In monetary terms, Munich has to date produced the highest theoretical market value of all the german Class-A cities. This is due to the high market rents and prices in Bavaria's capital. At EUR 16 billion, Berlin has pulled ahead – well ahead – of Munich (EUR 12 billion) in terms of total market value for the first time. Rising rents and prices, and particularly the significant increases in project space, have enabled the develop-and-hold market in the capital to grow particularly robustly in monetary terms. More than 90 percent of the total registered monetary increase is attributable to Berlin.

Develop-and-hold residential projects – Market values in study year 2021* by city

	MARKET VALUE				AVG. RESIDENTIAL AREA		NO. OF HOUSING UNITS		
	Actual 2021*	Change 2020-2021*			Actual 2021*		Actual 2021*	Change 2020-2021*	
	Absolute, in EUR million		Absolute (max. = EUR 4,200 million)	EUR/m2	2021	2020			Absolute (max. = 9,900)
Berlin	16,180	35 %		6,100	4.51	4.52	38,490	35 %	
Düsseldorf	2,090	7 %		6,700	5.51	5.42	4,810	1 %	
Frankfurt/Main	4,070	-10 %		7,500	5.20	5.13	8,880	-6 %	
Hamburg	4,610	-10 %		7,700	5.21	4.81	8,230	-20 %	
Cologne	1,690	22 %		5,300	4.63	4.37	4,710	5 %	
Munich	11,810	-1 %		10,400	4.32	5.00	16,200	9 %	
Stuttgart	1,520	11 %		6,000	4.22	4.18	3,740	13 %	
Total	41,970	11 %		6,100	4.68	4.77	85,060	13 %	

Source: Develop-and-Hold-Studie by Empira
** Cumulative residential space by study year in the projects to be completed up to four years after the study year.*

Planning pipeline growing in Berlin's develop-and-hold segment

As in the previous study, the planning pipeline[9] for develop-and-hold residential projects in the Class-A cities grew again. Once again, the majority of this increase was in Berlin. Expectations were strong in the last study that the pipeline would grow not only in Berlin but in other cities as well, but current figures indicate this did not occur. Munich and Stuttgart made a small contribution to the growth. The other cities experienced stagnation (or even a downturn in the case of Hamburg) in the planning pipeline in this segment.

9 Construction schedules were used to allocate the projects analyzed to either the "under construction" or the "in the planning stage" category. Changes in project volume in the planning stage provide a certain look into the future.

Develop-and-hold residential projects – Housing units by development status in study year 2021* by city

	Actual 2021*	Share	Change from 2020-2021*
	No. of housing units	Share	No. of housing units
Berlin	**38,490**		**9,760**
Under construction	15,230	40 %	4,350
In the planning stage	23,260	60 %	5,410
Düsseldorf	**4,810**		**30**
Under construction	1,250	26 %	220
In the planning stage	3,560	74 %	-190
Frankfurt/Main	**8,870**		**-540**
Under construction	3,750	42 %	180
In the planning stage	5,120	58 %	-720
Hamburg	**8,230**		**-2,020**
Under construction	3,670	45 %	-10
In the planning stage	4,560	55 %	-2,010
Cologne	**4,710**		**230**
Under construction	2,270	48 %	-190
In the planning stage	2,440	52 %	420
Munich	**16,200**		**1,290**
Under construction	7,200	44 %	-630
In the planning stage	9,000	56 %	1,920
Stuttgart	**3,750**		**1,180**
Under construction	730	19 %	120
In the planning stage	3,020	81 %	1,060
Total	**85,050**		**9,920**
Under construction	34,100	40 %	4,040
In the planning stage	50,950	60 %	5,880

* *Cumulative residential space by study year in the projects to be completed up to four years after the study year.*

Private-sector actors remain stable

A detailed view of the structure of actors in the develop-and-hold segment, which only this study provides to a greater extent, is even more interesting at this point. This study reflects the interplay between public-sector and private-sector actors in particular. Public-sector actors include municipal or state housing companies, for example. They hold 56 percent of the housing units presented here. Church-related actors or those with other social ties, along with conventional housing companies, hold a share of 11 percent. These players stand in contrast to classic private-sector actors, whose share of the housing units analyzed here amounts to 30 percent.

In the previous edition of the study[10], we were still able to put forth the theory that private-sector actors were experiencing an upswing, because their share in the Class-A cities had increased by nearly 4 percent, whereas the shares accounted for by public-sector actors, cooperative associations, and other institutions had each decreased. According to the figures in the current study, the share of private-sector actors remains stable, whereas the share of public-sector companies grew by more than five percent at the expense of the church-affiliated, social, and cooperative institutions. In absolute figures, both private-sector companies and public-sector actors saw gains in project volume, although the growth of the latter was more than three times that of the former.

10 evelop-and-Hold Study by EMPIRA, November 2020.

The fact that private-sector actors are maintaining their share and increased their volume is particularly impressive considering that these companies face increasing regulation and price wars for available parcels of land. The tendency toward moving from expensive Class-A cities to the less expensive surrounding areas or to Class-B and Class-C cities is also evident among these companies, so a portion of their housing construction activity is not covered by this study.[11]

The increase in project space attributable to public-sector housing companies also stemmed largely from Berlin. For some of the public-sector actors, developing their own residential projects was a completely new concept years ago. After the in-house resources and processes for project development were established, and this activity was also demanded and supported by the political sphere, growth in the total area of these projects was to be expected for precisely these players. Due to Berlin's overall market size, their volumes – public-sector housing companies in Berlin contributed more than 8,000 housing units to the overall growth – in turn drive the performance of the market as a whole.

Develop-and-hold residential projects – Housing units by development status in study year 2021* by type of actor

	ABSOLUTE NO. OF HOUSING UNITS	
	Actual 2021*	Change 2020-2021* Absolute
Cooperative		
Under construction	3,880	270
In the planning stage	4,070	1,270
	7,950	**1,540**
Church-affiliated		
Under construction	510	-490
In the planning stage	500	10
	1,010	**-480**
Public sector		
Under construction	20,250	4,150
In the planning stage	27,430	4,870
	47,680	**9,020**
Private sector		
Under construction	9,130	1,600
In the planning stage	16,730	1,260
	25,860	**2,860**
Other		
Under construction	330	-1,490
In the planning stage	2,230	-1,520
	2,560	**-3,010**
Total		
Under construction	34,100	4,040
In the planning stage	50,950	5,880
	85,050	**9,920**

** Cumulative residential space by study year in the projects to be completed up to four years after the study year.*
Some of the companies ("Other") were not allocated to another category for methodological reasons.

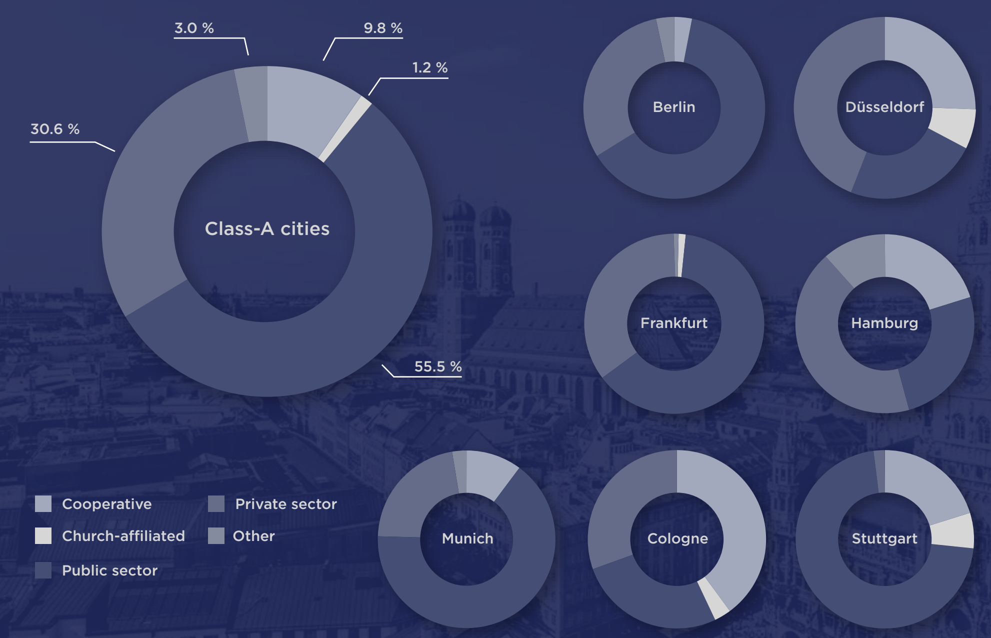
11 For methodological reasons, the analyses include only projects located within the territorial boundaries of the Class-A cities. Directly adjacent communities, which are, however, important for the housing market, therefore cannot be analyzed along with these.

Different breakdown of actors in each city

At the city level, the importance of the actors differs greatly. As in the first two studies, cooperatives in Düsseldorf, Stuttgart, Cologne, Hamburg, and Munich, for example, contribute substantially to the project volume in the develop-and-hold market, whereas they are all but irrelevant in Frankfurt/Main and Berlin. These structures usually remain very constant. In Munich and Cologne, however, the share of cooperatives is noticeably higher this time.

Public-sector housing companies are very important actors in all Class-A cities. More than 50 percent of the develop-and-hold project area in Berlin, Munich, Frankfurt/Main, and Stuttgart is attributable to these companies. Whereas this share was nearly 75 percent in Frankfurt/Main in the previous study[12], it declined considerably to 63 percent this time. In contrast, Berlin's figure rose sharply from approximately 30 percent previously to 63 percent now.

Develop-and-hold residential projects – Housing units by actor group in study year 2021* in the seven Class-A cities



Cumulative residential space by study year in the projects to be completed up to four years after the study year.

Private-sector companies are also relevant in all markets. They are particularly strongly represented in Düsseldorf, Frankfurt/Main, and Hamburg. Larger changes in this segment occurred in Frankfurt/Main (up from under 15 percent to 35 percent) and Berlin (down from 37 percent to currently 31 percent). In Stuttgart, the share is two percent, currently the lowest among the cities in question.

Private-sector companies increasingly appear in top rankings

Across all seven Class-A cities, private-sector holders of residential portfolios are increasingly taking stronger positions in the rankings[13] than project developers. In the first study[14], BUWOG was still the only private-sector ac-

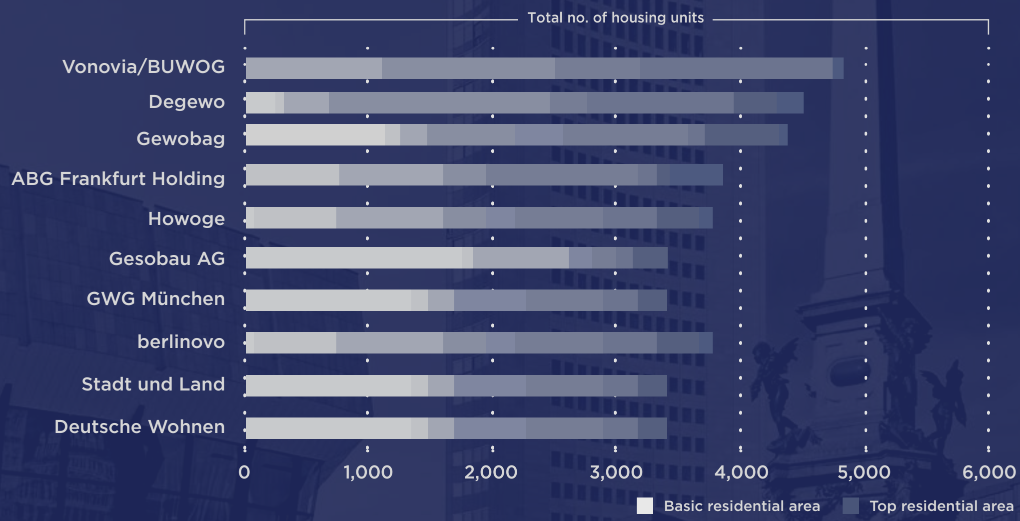
12 Develop-and-Hold Study by EMPIRA, November 2020.
13 The ranks are determined according to housing under construction and in the planning stage (up to and including 2025).
14 Develop-and-Hold Study by EMPIRA, September 2019.

tor in the top ten companies in the develop-and-hold residential segment. Deutsche Wohnen made the list in the second study[15]. Both companies were considerably expanding their portfolio of projects at this time. In the current study, Vonovia and BUWOG take the uppermost spots among the top ten companies in the ranking. Deutsche Wohnen also made the top ten once again. Thanks to the acquisition, the Vonovia/Deutsche Wohnen Group will take a secure lead in the top ten develop-and-hold residential project ranking in the future.

Below the top ten, the following private-sector companies with at least 500 housing units each are notable: Empira (2,100 housing units), Taurecon (approx. 750 housing units), Aldi Nord (approx. 550 housing units), Commerz Real, and Industria Wohnen (approx. 500 housing units each). Other examples of private-sector companies with a project pipeline estimated at under 500 housing units each in the Class-A cities are Solidaire Real Estate, International Campus Group, Trei Real Estate, Hines, NFInvest, Dawonia Real Estate, I Live, Landmarken, and Vivawest. Some of these companies are very active outside of the Class-A cities (in the Ruhr region, for example) and therefore only represented in the study with part of their project portfolio. A number of these companies focus on microapartments.

BUWOG, the project developer that merged with Vonovia, or Isaria's project and personnel portfolio, which was acquired by Deutsche Wohnen, are examples of how conventional private-sector residential portfolio holders initiate and establish the project development process in their corporate structures. In this way, companies like this can also build their own project development operations. In addition to Vonovia/BUWOG (plus around 600 housing units) and Deutsche Wohnen (plus around 750 housing units), current figures indicate that some other private-sector companies are stepping up their project development activities. Notable in this regard are Empira (plus 360 housing units), Aldi Nord (plus approx. 350 housing units), and Solidaire Real Estate (plus approx. 200 housing units).

Develop-and-hold residential projects – Top actors by housing units in study year 2021* in the seven Class-A cities



Cumulative residential space by study year in the projects to be completed up to four years after the study year.

15 Develop-and-Hold-Studie by EMPIRA, November 2020.

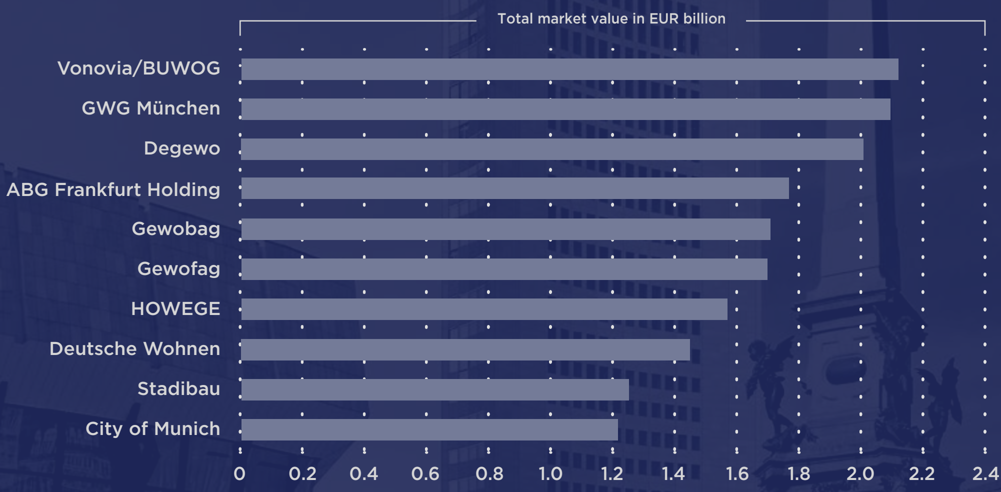
Berlin's public-sector housing companies dominate top ten ranking

Despite this impressive development by the private-sector segment, public-sector actors continue to dominate the ranking in the develop-and-hold residential segment. Berlin-based housing companies Degewo and Gewobag each develop over 4,000 housing units, and along with Howoge, Berlinovo, as well as Stadt und Land, a total of five public-sector housing companies from Berlin are represented in the top ten. Of companies in the other cities, ABG Frankfurt Holding and GWG in Munich made it into the top ten. No housing construction co-operatives or other groups of actors in any of the Class-A cities are represented in the top-ten ranking. At city level, such actors do make the cut, however. In general, the average project volume per actor in this ranking is significantly higher than in the previous study.

Munich's companies benefit from a market value-based ranking

If the theoretical market value is used to rank actors, then players from the expensive Munich market reach higher positions. These include the municipal housing companies GWG Mün-

Develop-and-hold residential projects – Top actors by market value in study year 2021* in the seven Class-A cities



** Cumulative residential space by study year in the projects to be completed up to four years after the study year.*

chen and Gewofag, as well as Stadibau, a housing company run by the state of Bavaria for Bavarian public servants, and the city of Munich itself, which is currently active particularly with the Hybrid.M project. Here also, Vonovia/BUWOG has come to dominate the market, and Deutsche Wohnen now takes eighth place. This is the first time that two private companies are represented in the top ten in terms of market value. Three public-sector housing companies from Berlin placed in the market-value ranking; Frankfurt/Main was again represented in the ranking by ABG Frankfurt. Hamburg-based Saga just missed the top ten, losing its prior-year position.

It should not be forgotten that the theoretical market value is based on a calculation using market KPIs. In the case of public companies, rents often fall below free-market rents, so the actual capitalized value of these projects is markedly lower. The theoretical market value shown here is therefore not the actual capitalized value of the company. If the actual capitalized value were assumed, a few of the private-sector actors might also appear in the top ten. The next possible private-sector candidate would be Empira AG, although it places 17th, with some other public-sector companies in between – mainly from Berlin – which benefit in the ranking from their large project volumes.

1.3 Regional market summaries

1.3.1 Berlin

Berlin is the largest market for residential project development of all the Class-A cities. The national capital's total residential project volume in the develop-and-hold segment currently amounts to 38,500 housing units.[16] That is a substantial 25 percent more than in the previous study.[17] Larger-scale new projects include those on Bisamstraße, on Lichterfelder Ring (each more than 300 housing units), and on Segelfliegerdamm (around 450 apartments) by Degewo; the apartments on Cecilienstraße (more than 300 housing units) by berlinovo; the urbany property (around 800 housing units) by Gewobag; the Stadtgut Hellersdorf complex (more than 1,400 housing units) and the project on Idunastraße (more than 400 housing units) by Gesobau. The private-sector companies also have new projects included in the analysis, for instance, Vonovia/Buwog's Wohnwerk Sammler project (around 200 housing units). These are far smaller in size, however. As in the previous year, public-sector companies in particular introduced new, large-scale projects to the market.

Besides the develop-and-hold projects, there are some 39,000 housing units developed for sale[18], more than 10 percent fewer than in the previous study. Taking both segments together, a total of 15,000 units can be expected per year, around 500 housing units more than in the previous study year. In view of the fact that housing demand in Berlin[19] amounts to nearly 19,500 residential units, the supply of residential projects in Berlin is still clearly insufficient.

Approximately 63 percent of housing units in the develop-and-hold segment in Berlin are developed by public-sector actors, up more than 10 percentage points. Private companies construct 31 percent of housing units, a share that has declined since the previous study.

16 This is the number of housing units completed between 2021 and 2025; projects whose duration is longer than 2025 are included proportionately.
17 Develop-and-Hold Study by EMPIRA, November 2020.
18 bulwiengesa Project Developer Study 2021.
19 Housing Demand Forecast, bulwiengesa AG, spring 2021; annual average replacement/additional demand across all seven Class-A cities from 2021 to 2025.

Develop-and-hold residential projects in Berlin – Housing units by development status in study year 2021* by type of actor

	ABSOLUTE NO. OF HOUSING UNITS	
	Actual 2021*	Change 2020-2021* Absolute
Cooperative		
Under construction	350	-570
In the planning stage	850	590
	1,200	**20**
Church-affiliated		
Under construction	90	-550
In the planning stage	30	-
	120	**-550**
Public sector		
Under construction	10,190	3,880
In the planning stage	13,880	4,960
	24,060	**8,820**
Private sector		
Under construction	4,470	1,890
In the planning stage	7,480	-570
	11,960	**1,320**
Other		
Under construction	130	-300
In the planning stage	1,020	440
	1,160	**150**
Total		
Under construction	15,230	4,350
In the planning stage	23,260	5,410
	38,490	**9,760**

** Cumulative residential space by study year in the projects to be completed up to four years after the study year.*

In terms of the theoretical market value[20], private-sector companies in the develop-and-hold segment still have a higher average level per square meter in their project spaces. However, the project volume of the public-sector housing companies is so high that their total theoretical market value still substantially exceeds that of the private-sector actors.

Develop-and-hold residential projects in Berlin – Market values in study year 2021* by type of actor

	MARKET VALUE 2021			AVG. RESIDENTIAL AREA	
	In EUR million	Change 2020- 2021*	EUR/m2	2021	2020
Cooperative	570	140	6,000	4.46	4.59
Church-affiliated	40	-160	4,900	3.75	3.88
Public sector	9,270	3,960	5,900	4.38	4.41
Private sector	5,780	1,510	6,700	4.75	4.77
Other	510	120	6,600	5.00	0.00
Total	16,180	5,570	6,100	4.51	4.41

** Cumulative residential space by study year in the projects to be completed up to four years after the study year.*

20 For details, see the Glossary.

The state of Berlin's public housing companies Degewo and Howoge continue to number among the top actors in Berlin, although no longer both in first place. BUWOG had already expanded its project volume in Berlin significantly in the previous study, and now Vonovia along with BUWOG ranks ahead of Howoge in third place. In addition to these companies, Deutsche Wohnen (with projects such as Quartier Marienufer) and Taurecon (with Quartier Heidestraße) are private-sector actors placing in the top ten. The top-ten ranking is still dominated by public-sector actors. Gains in project volume since the previous study have therefore been achieved mostly by public housing companies, including Gewobag, Howoge, Gesobau, berlinovo, Stadt und Land, and WBM. Places 11 to 20 are occupied by Aldi Nord, Industria Wohnen, Empira, Trei Real Estate, NFInvest, Kintyre Investments, Lakeward Management, Belle Époque Immobilien, UTB, and Van Caem – all private-sector companies – with an average of 340 housing units per actor.

Develop-and-hold residential projects – Top actors by housing units in study year 2021* in Berlin

** Cumulative residential space by study year in the projects to be completed up to four years after the study year.*

1.3.2 Düsseldorf

Along with Cologne and Stuttgart, Düsseldorf is among the smaller markets in the residential project development segment. The project volume in the develop-and-hold segment in this market is very stable, again amounting to some 4,700 housing units.[21] Just under 13,000 housing units[22] contributed by conventional projects developed for sale were marketed in Düsseldorf, 1,000-plus fewer than in the previous study.[23] Together this amounts to some 3,500 units per year.

A higher than average number of housing units is being built in Düsseldorf, which is evident from the relative number of residential units per inhabitant. The values calculated above therefore in fact exceed the housing demand totaling approximately 3,800 residential units[24] per year in Düsseldorf. However, in Düsseldorf, larger-scale residential projects continue to be carried out primarily by conventional project developers, i.e., they are developed for sale. These projects frequently experience planning delays; an example is the Glasmacherviertel project. This remains an indicator that the number of projects completed annually in Düsseldorf could actually be lower than estimated at this time.

21 This is the number of housing units completed between 2021 and 2025; projects whose duration is longer than 2025 are included proportionately.
22 See bulwiengesa Project Developer Study 2021.
23 Develop-and-Hold Study by EMPIRA, November 2020.
24 See Housing Demand Forecast, bulwiengesa AG, spring 2021; annual average replacement/additional demand across all seven Class-A cities from 2021 to 2025.

The larger develop-and-hold projects newly added in Düsseldorf are the Grand Central by Consus Real Estate (around 150 apartments to be held in the portfolio), the Sonnenblumenfeld project by Düsseldorfer Bau- und Spargenossenschaft (around 100 housing units), and the project by Empira on Moltkestraße on the former Telekom property (230 housing units). Projects with more than 200 housing units also include the Ben & Mara property (more than 600 apartments) by IDR and Kyros, the Neue Urbane Bauen and addition to the Grünau residential complex (each more than 200 apartments) by Städtische Wohnungsgesellschaft Düsseldorf, 240 apartments on Jägerstraße (Vivawest), as well as the Leben am Sonnenpark project (Landmarken) and Arcadia Höfe (Brune).

A total of 44 percent of housing units in the develop-and-hold segment are attributable to private-sector actors, which therefore continue to be the strongest group. In no other Class-A city do private-sector companies hold a larger share. Public-sector actors develop 24 percent of the housing units in Düsseldorf. Cooperatives, which are generally well represented in Düsseldorf, hold a share of 26 percent, which is notably high.

Considering their residential areas, the quality offered by private companies exceeds that of public companies in Düsseldorf. In addition, large-scale projects or urban districts developed often create their own new residential areas.

Develop-and-hold residential projects in Düsseldorf – Housing units by development status in study year 2021* by type of actor

	ABSOLUTE NO. OF HOUSING UNITS	
	Actual 2021*	Change 2020-2021*
		absolut
Cooperative		
Under construction	390	200
In the planning stage	810	-20
	1,200	**170**
Church-affiliated		
Under construction	290	160
In the planning stage	30	-70
	320	**100**
Public sector		
Under construction	320	170
In the planning stage	880	-150
	1,110	**20**
Private sector		
Under construction	330	-220
In the planning stage	1,830	290
	2,160	**80**
Other		
Under construction	10	-90
In the planning stage	-	-260
	10	**-350**
Total		
Under construction	1,250	220
In the planning stage	3,560	-190
	4,810	**30**

** Cumulative residential space by study year in the projects to be completed up to four years after the study year.*

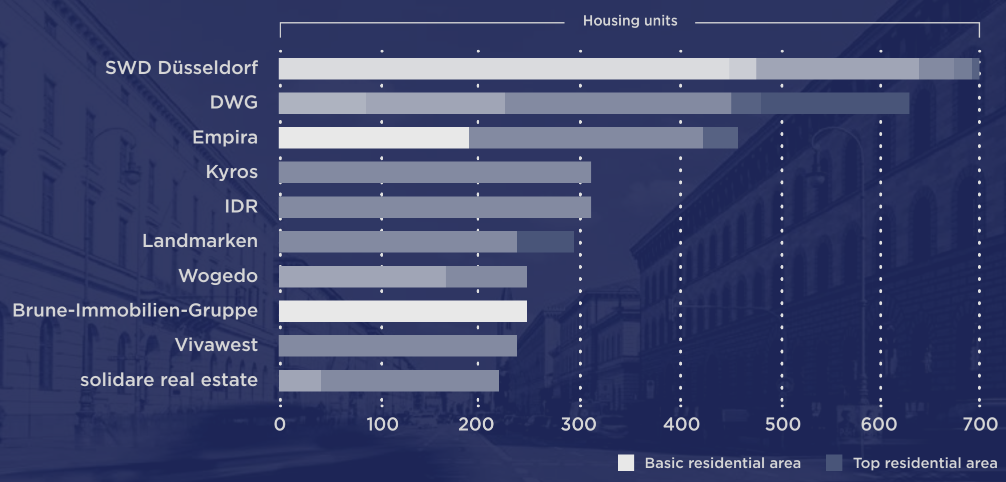
Develop-and-hold residential projects in Düsseldorf – Market values in study year 2021* by type of actor

	MARKET VALUE 2021			AVG. RESIDENTIAL AREA	
	In EUR million	Change 2020-2021*	EUR/m²	2021	2020
Cooperative	600	163	6,900	5.81	5.74
Church-affiliated	120	43	5,600	4.80	4.63
Public sector	480	76	6,200	5.13	4.94
Private sector	880	151	7,000	5.61	4.97
Other	10	-182	7,100	6.50	0.00
Total	2,090	250	6,700	5.51	6.15

** Cumulative residential space by study year in the projects to be completed up to four years after the study year.*

Düsseldorf's develop-and-hold market is small: All told, there are fewer than 30 actors operating there. In terms of the top ten, the top actor is the municipal housing company Städtische Wohnungsgesellschaft Düsseldorf (SWD). Its largest projects are the Neue Urbane Bauen project and the addition to the Grünau complex. Düsseldorfer Wohnungsgenossenschaft (DWG) remains in second place. Its major project remains the new construction on the former Rheinbahn property in which companies such as BPD, Concepta, and BNS are involved with develop-to-sell projects. The project on Moltkestraße newly included and projects on Mindener Straße and Hans-Böckler-Straße, Empira has now taken third place in Düsseldorf's develop-and-hold segment. Private companies Empira, Kyros, Landmarken, Vivawest, and Solidaire Real Estate make up five of the top ten actors in Düsseldorf. This is large share of private actors compared to the other Class-A cities.

Develop-and-hold residential projects – Top actors by housing units in study year 2021* in Düsseldorf



** Cumulative residential space by study year in the projects to be completed up to four years after the study year.*

1.3.3 Frankfurt/Main

In the financial hub of Frankfurt/Main, 35 percent of housing units under construction and in the planning stage are completed as develop-and-hold projects. That totals 8,880 residential units[25] and therefore 500 units fewer than in the previous study. Despite the decline, this volume now exceeds the project volume of Hamburg, which has almost three times as many inhabitants. The stable develop-for-sale segment adds another 16,200 housing units,[26] for some 5,000 units developed per year in Frankfurt, which is 100 residential units fewer than in the previous study. Whereas the number of properties developed for sale declined back then, the downturn in the develop-and-hold segment is “at fault” here this time. In contrast, housing demand in Frankfurt/Main amounts to approximately 6,800 housing units per year.[27] Demand thus continues to be much higher, even though an above-average level of residential space is already being developed in Frankfurt. Measured by the number of inhabitants, Frankfurt and its project development activity take the top spot among all Class-A cities.

A total of 63 percent of housing units in the develop-and-hold segment in Frankfurt are developed by public-sector housing companies, which is nine percentage points less than in the previous study. In contrast, the share of housing units in the segment developed by private-sector companies now amounts to 35 percent, up seven percentage points. Municipal housing company ABG Frankfurt continues to operate in the market with several larger projects planned: Rebstockpark with more than 900 housing units; Städtische Kliniken Frankfurt am Main-Höchst and ABG-Mietwohnungen am Güterplatz, each with more than 250 housing units; Kulturcampus in Bockenheim with 1,300 housing units; the Im Hilgenfeld project with more than 800 housing units; the addition to the Platensiedlung property with more than 550 housing units, and Stadtquartier am Römerhof with 2,000 housing units. Larger projects are also being developed by Nassauische Heimstätte (Schönhof-Viertel with 900 housing units, the former Siemens property with more than 500 housing units) and GWH Hessen (Variana with more than 300 housing units), both of which are public-sector companies, too. In addition, private-sector companies operate at this level, e.g., the F.A.Z. Group along with Daniel Hopp Family Office (Hellerhöfe with a total of 650 housing units).

25 This is the number of housing units completed between 2021 and 2025; projects whose duration is longer than 2025 are included proportionately.
26 See Bulwiengesa Project Developer Study 2021.
27 See Housing Demand Forecast, bulwiengesa AG, spring 2021; annual average replacement/additional demand across all seven Class-A cities from 2021 to 2025.

Develop-and-hold residential projects in Frankfurt/Main – Housing units by development status in study year 2021* by type of actor

	ABSOLUTE NO. OF HOUSING UNITS	
	Actual 2021*	Change 2020-2021*
		absolut
Cooperative		
Under construction	30	-
In the planning stage	10	10
	50	**20**
Church-affiliated		
Under construction	-	-40
In the planning stage	110	-
	110	**-40**
Public sector		
Under construction	2,270	-120
In the planning stage	3,340	-990
	5,610	**-1,110**
Private sector		
Under construction	1,450	640
In the planning stage	1,630	470
	3,080	**1,110**
Other		
Under construction	-	-300
In the planning stage	30	-200
	30	**-500**
Total		
Under construction	3,750	180
In the planning stage	5,120	-720
	8,880	**-520**

** Cumulative residential space by study year in the projects to be completed up to four years after the study year.*

Private-sector companies in Frankfurt/Main tend to develop projects in good residential areas. High-quality residential towers in centrally located neighborhoods play an important role in this regard. Since 2014, these have captured an increasingly large market share in the residential segment and are a symbol of Frankfurt. Examples from the develop-and-hold segment are the Great East (Deutsche Wohnen), the Heaven project by the Artisa Group, One Forty West by Commerz Real, Anter Carree by Solidaire Real Estate, and the Kolb 13 project by MEAG. Only a limited number of high-rise projects are being developed by municipal companies, in contrast. Currently, only the Ruby Tower by GWH is included in the analysis. Among other things, this is the reason for the private companies' higher average market values per square meter.[28] Nonetheless, municipal and state housing companies top private actors in theoretical market value, because their market share – measured by the number of housing units – is nearly twice that of private-sector companies.

28 For details, see the Glossary.

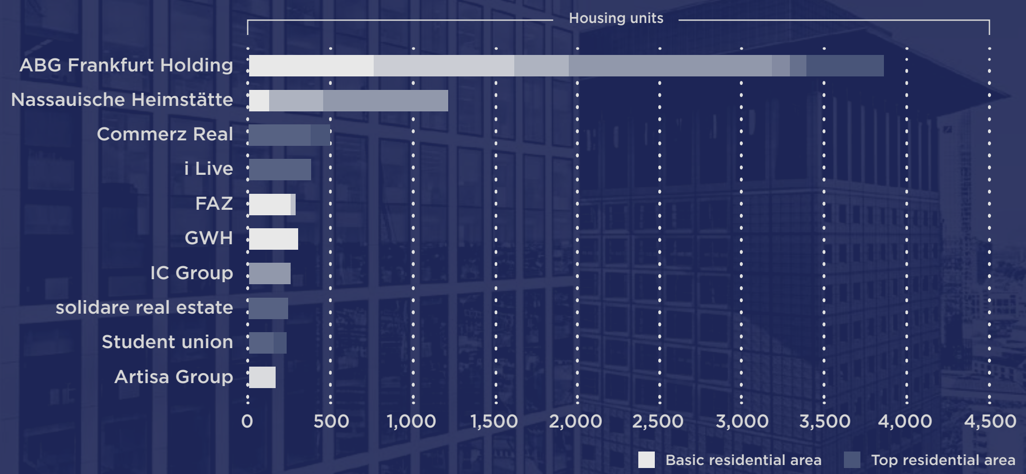
Develop-and-hold residential projects in Frankfurt/Main – Market values in study year 2021* by type of actor

	MARKET VALUE 2021			AVG. RESIDENTIAL AREA	
	In EUR million	Change 2020-2021*	EUR/m²	2021	2020
Cooperative	30	10	7,400	5.50	6.00
Church-affiliated	40	-20	6,800	5.75	5.50
Public sector	2,560	-230	7,000	4.98	4.89
Private sector	1,440	420	8,000	5.37	5.38
Other	20	-240	7,800	5.00	0.00
Total	4,070	-50	7,500	5.20	5.23

** Cumulative residential space by study year in the projects to be completed up to four years after the study year.*

The ranking also highlights the importance of the role played by public-sector actors in the develop-and-hold residential segment in Frankfurt/Main. ABG Frankfurt still dominates the market by far, with Nassauische Heimstätte in second place. Although the actors in the ranking include some private-sector companies (i Live, F.A.Z., IC Group, solidare real estate, Artisa Group), their volumes fall well below the levels of the actors in first and second place.

Develop-and-hold residential projects – Top actors by housing units in study year 2021* in Frankfurt/Main



** Cumulative residential space by study year in the projects to be completed up to four years after the study year.*

1.3.4 Hamburg

After Berlin and Munich, Hamburg is the third largest market for residential development projects. According to current analyses, 8,200 housing units are being created as develop-and-hold projects in the Free and Hanseatic City;[29] this is around 20 percent fewer than in the previous study. In Hamburg, another nearly 20,000 housing units developed for sale can be added to these housing units to be held.[30] The number of these conventional development projects dropped sharply once again. On balance, only approximately 5,600 housing units are developed in Hamburg each year. In contrast, the housing demand calculated amounts to approximately 9,400 housing units per year[31]. Once again, Hamburg's supply is unable to cover its demand quantitatively, which is also evident in view of the relative amount of residential project area per inhabitant. In this context, Hamburg is in second to the last place among the Class-A cities in view of its size. Because its housing company Saga is not very transparent with its planning, some of the residential projects in Hamburg may be missing from the analysis. Whether this difference is sufficient to close the gap of more than 3,000 housing units remains to be seen.

Some new projects are included in the develop-and-hold segment this time. For example, Deutsche Wohnen grew its project pipeline in Hamburg by acquiring some projects (e.g., Hegencenter) from Isaria. Quantum and Baugenossenschaft dhu are represented in the market by the Julius-Vosseler-Siedlung project with more than 200 rental apartments, and the municipal housing company Saga has also launched new projects such as the Mesterkamp urban district in Barmbek-Süd.

Private-sector companies have constituted the largest group of develop-and-hold actors in Hamburg since 2020, currently totaling 42 percent. To the extent the projects are known, public-sector actors account for 26 percent and cooperatives for 21 percent, which means the breakdown of actors in Hamburg is relatively balanced. Church-related and social institutions are not currently active developers in the Hanseatic City.

29 This is the number of housing units completed between 2021 and 2025; projects whose duration is longer than 2025 are included proportionately.
30 See Bulwiengesa Project Developer Study 2021.
31 See Housing Demand Forecast, bulwiengesa AG, spring 2021; annual average replacement/additional demand across all seven Class-A cities from 2021 to 2025.

Develop-and-hold residential projects in Hamburg – Housing units by development status in study year 2021* by type of actor

	ABSOLUTE NO. OF HOUSING UNITS	
	Actual 2021*	Change 2020-2021* (Absolute)
Cooperative		
Under construction	1,080	-10
In the planning stage	610	-370
	1,690	**-380**
Church-affiliated		
Under construction	-	-
In the planning stage	-	-
	-	**-**
Public sector		
Under construction	1,310	830
In the planning stage	770	-900
	2,090	**-70**
Private sector		
Under construction	1,100	-840
In the planning stage	2,410	320
	3,510	**-520**
Other		
Under construction	180	10
In the planning stage	760	-1,060
	950	**-1,050**
Total		
Under construction	3,670	-10
In the planning stage	4,560	-2,010
	8,230	**-2,020**

** Cumulative residential space by study year in the projects to be completed up to four years after the study year.*

Private-sector companies in Hamburg likewise develop projects mostly in higher quality residential areas for the develop-and-hold segment. Their project volume, measured by market value per square meter, as well as their total theoretical market value[32] are each the highest.

Develop-and-hold residential projects in Hamburg – Market values in study year 2021* by type of actor

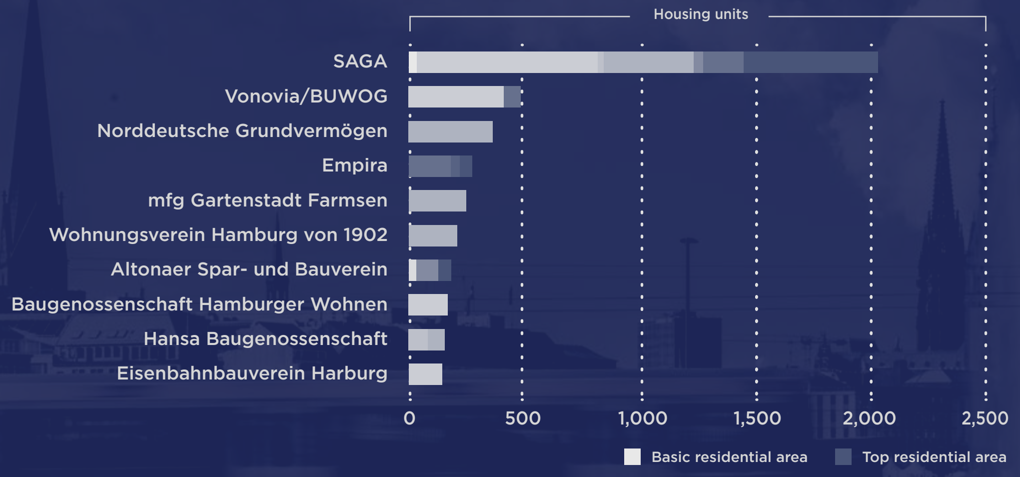
	MARKET VALUE 2021			AVG. RESIDENTIAL AREA	
	In EUR million	Change 2020-2021*	EUR/m²	2021	2020
Cooperative	850	-74	7,000	4.98	4.81
Church-affiliated	-	-	-	-	-
Public sector	1,110	90	7,000	4.93	4.72
Private sector	2,090	247	8,500	5.56	5.08
Other	560	-355	7,100	4.61	0.00
Total	4,610	-90	7,700	5.21	4.50

** Cumulative residential space by study year in the projects to be completed up to four years after the study year.*

32 For details, see the Glossary.

Although private-sector companies in Hamburg again make up the majority of residential project volume, Hamburg's market for develop-and-hold projects has been strongly dominated by its housing company Saga GWG since the study began. Saga is responsible for 20 percent of total develop-and-hold project space and is developing various projects in Hamburg in the time period analyzed. Second position in the ranking by a considerable interval is held by Vonovia/Buwog, most of the space of which is located in the Bergedorf urban district still in the planning stage. Other private companies represented are Norddeutsche Grundvermögen (Quartier am Neumarkt) and Empira (three projects including Gustav-Adolf-Straße). All other companies in the top ten ranking are housing construction cooperatives and associations. The importance of cooperatives in Hamburg's top ten has increased markedly.

Develop-and-hold residential projects – Top actors by housing units in study year 2021* in Hamburg



Cumulative residential space by study year in the projects to be completed up to four years after the study year.

1.3.5 Cologne

Currently, 4,720 housing units are being developed in the develop-and-hold segment in the cathedral city of Cologne.[33] After a significant decline in the previous study year, the volume there again recovered somewhat. Another approximately 13,000 apartments were added to these housing units thanks to projects developed for sale.[34] The volume in this category also again rose slightly. In Cologne, some 3,600 housing units are now being developed each year, 400 more than in the previous study.[35] This is a gratifying development. In contrast, housing demand in Cologne is markedly higher, amounting to around 7,300 housing units per year.[36] The gap between supply and demand remains very large in Cologne's housing market, although these figures are up overall.

The growth in space in the develop-and-hold segment in Cologne is attributable mainly to stable cooperatives and private-sector companies. Public-sector housing companies again reported a decrease in housing units in the planning stage and under construction, including the largest player, GAG Immobilien AG.

Develop-and-hold residential projects in Cologne – Housing units by development status in study year 2021* by type of actor

	ABSOLUTE NO. OF HOUSING UNITS	
	Actual 2021*	Change 2020-2021*
		Absolute
Cooperative		
Under construction	1,360	440
In the planning stage	400	160
	1,760	**590**
Church-affiliated		
Under construction	40	-50
In the planning stage	100	100
	140	**50**
Public sector		
Under construction	620	-730
In the planning stage	560	-120
	1,180	**-850**
Private sector		
Under construction	240	200
In the planning stage	1,380	460
	1,620	**650**
Other		
Under construction	-	-60
In the planning stage	-	-170
	-	**-230**
Total		
Under construction	2,270	-190
In the planning stage	2,440	420
	4,710	**230**

** Cumulative residential space by study year in the projects to be completed up to four years after the study year.*

33 This is the number of housing units completed between 2021 and 2025; projects whose duration is longer than 2025 are included proportionately.
34 See Bulwiengesa Project Developer Study 2021.
35 Develop-and-Hold Study by EMPIRA, November 2020.
36 See Housing Demand Forecast, bulwiengesa AG, spring 2021; annual average replacement/additional demand across all seven Class-A cities from 2021 to 2025.

Theoretical market value[37] in Cologne's develop-and-hold segment has risen considerably, mainly due to the growing project volume as well as higher rents and prices. This time this is one of the most dynamic markets among the Class-A cities with a growth rate of 22 percent. Nonetheless, Cologne along with Stuttgart are the Class-A cities with the lowest theoretical market value due to their market size.

Develop-and-hold residential projects in Cologne – Market values in study year 2021* by type of actor

	MARKET VALUE 2021			AVG. RESIDENTIAL AREA	
	In EUR million	Change 2020-2021*	EUR/m²	2021	2020
Cooperative	650	289	5,200	4.69	4.40
Church-affiliated	50	9	6,100	5.50	5.50
Public sector	360	-156	4,200	3.75	3.19
Private sector	630	332	6,100	5.18	5.28
Other	-	-78	-	0.00	4.86
Total	1,690	397	5,300	4.63	4.86

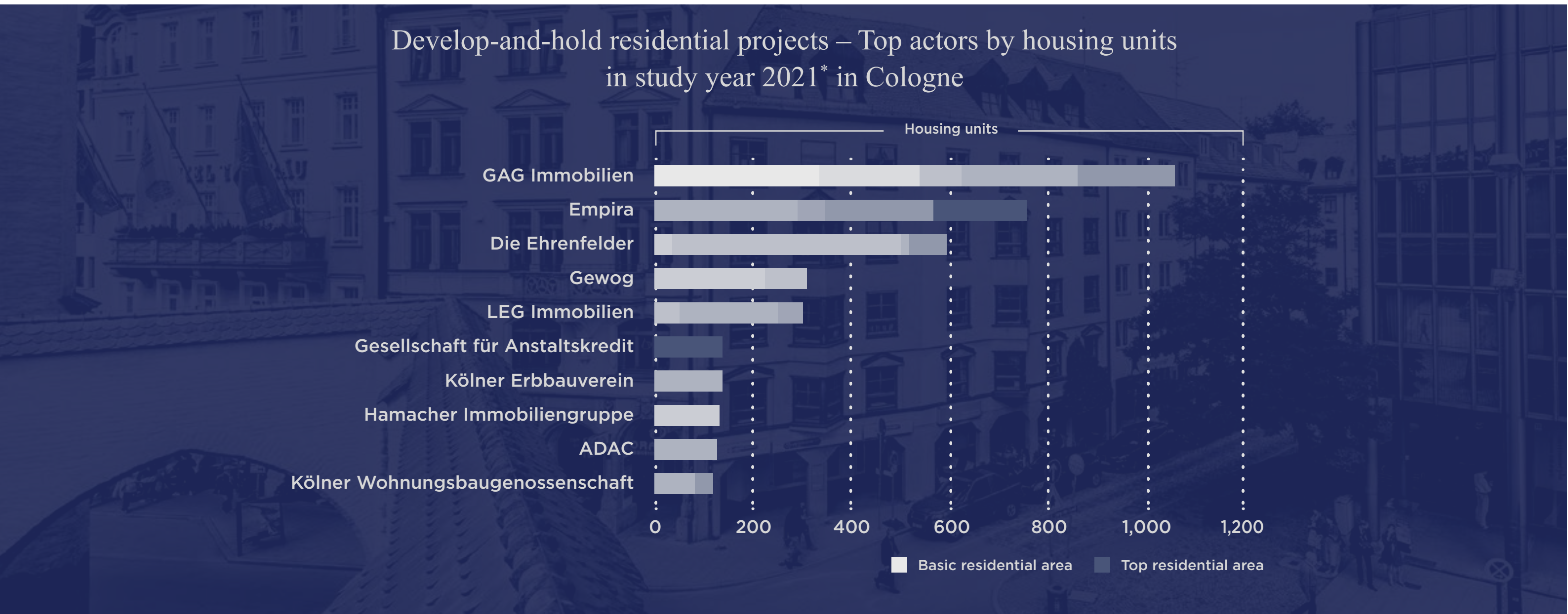
** Cumulative residential space by study year in the projects to be completed up to four years after the study year.*

In Cologne, by far the most significant actor in the develop-and-hold segment is GAG Immobilien, a listed company, in which the city of Cologne holds well over 80 percent and is therefore classified as a public-sector actor. Its largest project is Butzweilerhof (three construction sites, total of around 400 housing units). Since the completion of Sürther Feld and Clouth-Areal three years ago now, GAG is down more than 200 housing units in the current analysis and is no longer at the volume of the previous study year. However, the company still has some projects in the near-term pipeline, which cannot be taken into account at the moment, so this decline will likely be offset again quickly.

This time, Empira takes second place in the develop-and-hold residential segment in Cologne. The private company has increased its project volume in Cologne by 40 percent with the acquisition of Ehrenfeldgürtel and the planned demolition and new construction there. In addition, the Die Welle project, which has only been included proportionately to date, provides the company with the potential to further increase its project volume. In this year's study, Die Ehrenfelder cooperative has substantially more project space in its portfolio than in the previous year thanks to a complete restoration, an in-fill development, a new urban district, and a property featuring demolition and new construction. Both companies are therefore slowly approaching GAG, which has been dominant to date in the ranking.

The other actors all have considerably fewer housing units on the market. Four of the top ten companies are housing cooperatives, and five are private-sector actors. These include ADAC, which aims to construct more than 100 affordable housing units in five wings in Cologne's Zollstock neighborhood.

37 For details, see the Glossary.



** Cumulative residential space by study year in the projects to be completed up to four years after the study year.*

1.3.6 Munich

A total of 16,200 housing units are being developed in Bavaria's capital in the develop-and-hold segment,[38] more than 1,000 apartments more than in the previous study. Munich is responsible for planning and building nearly twice as many develop-and-hold housing units as Hamburg, which is a comparable size city.

Another approximately 20,200 housing units are developed for sale[39], which corresponds to a decline in project volume compared with the previous study (minus 3,800 housing units), since conventional project developers are also moving to the areas surrounding the expensive city of Munich. Both strategies therefore produce 7,200 housing units annually, 600 fewer per year than calculated previously. This project volume still does not cover the housing demand amounting to approximately 8,900 housing units[40] per year for Munich.

We already pointed this out in the previous study: In the Munich develop-and-hold segment, large urban development areas play a key role as a source for new parcels of land. Strict allocation of parcels by concept by the city means that Munich can apply very stringent regulations. The share of public-sector actors responsible for housing units under construction or in the planning stage is high as a result (64 percent). Larger projects include Hybrid.M by Stadtwerke München and the residential facility for public servants in southern Oberwiesenfeld by Stadibau.

Private companies (21 percent) are also active in Munich's develop-and-hold segment, however, and have launched new projects on the market. For instance, Deutsche Wohnen is now develo-ping the Hofmark project for its own portfolio after taking it over from Isaria, and Dawonia has communicated a new plan for the Am Dülferanger urban district. Cooperatives are also deve-

38 This is the number of housing units completed between 2021 and 2025; projects whose duration is longer than 2025 are included proportionately..
39 See Bulwiengesa Project Developer Study 2021.
40 See Housing Demand Forecast, bulwiengesa AG, spring 2021; annual average replacement/additional demand across all seven Class-A cities from 2021 to 2025.

loping many new projects. New project space is being created by these actors in the Kreativ-quartier, among other locations. The housing construction cooperative Wagnis has a new plan to develop more than 100 apartments on Germeringer Weg. These newly planned projects have sharply increased the share of planned projects by cooperatives in Munich, from three percent to more than eight percent.

Develop-and-hold residential projects in Munich – Housing units by development status in study year 2021* by type of actor

	ABSOLUTE NO. OF HOUSING UNITS	
	Actual 2021*	Change 2020-2021* Absolute
Cooperative		
Under construction	440	180
In the planning stage	840	620
	1,280	**800**
Church-affiliated		
Under construction	-	-110
In the planning stage	90	-20
	90	**-130**
Public sector		
Under construction	5,290	200
In the planning stage	5,660	1,150
	10,950	**1,360**
Private sector		
Under construction	1,470	-140
In the planning stage	1,990	420
	3,460	**280**
Other		
Under construction	-	-770
In the planning stage	420	-250
	420	**-1,010**
Total		
Under construction	7,200	-630
In the planning stage	9,000	1,920
	16,200	**1,290**

** Cumulative residential space by study year in the projects to be completed up to four years after the study year.*

With its high rents and prices, Munich has a notably high average theoretical market value[41] per square meter compared with the other Class-A cities. Only Munich has reached EUR 10,000 per square meter to date. The individual groups of actors are very uniformly at or above this level. Only cooperatives have a somewhat lower and private companies a higher average value. Because theoretical market values per square meter have again risen substantially, Munich was able to increase its total value in monetary terms despite a slight downturn in project volume.

41 For details, see the Glossary.

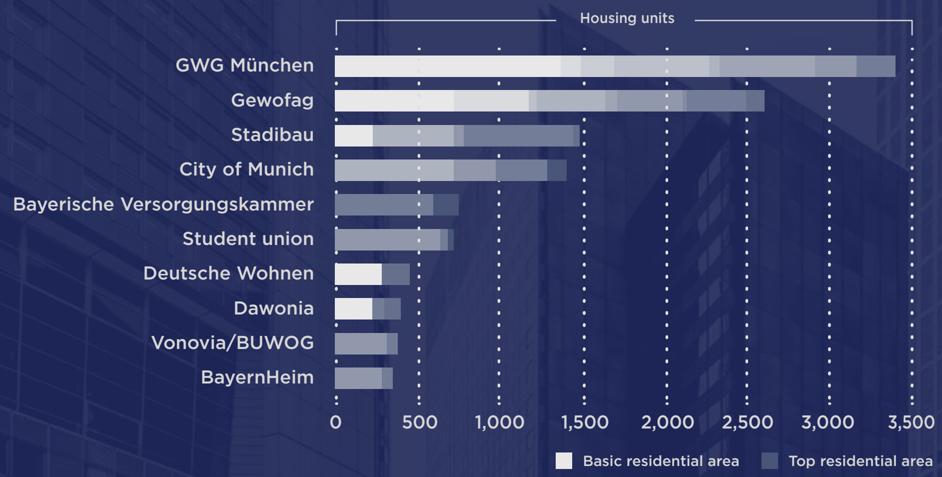
Develop-and-hold residential projects in Munich – Market values in study year 2021* by type of actor

	MARKET VALUE 2021			AVG. RESIDENTIAL AREA	
	In EUR million	Change 2020-2021*	EUR/m²	2021	2020
Cooperative	860	517	9,100	3.82	4.95
Church-affiliated	70	-153	11,900	4.50	6.40
Public sector	7,910	927	10,100	4.21	4.73
Private sector	2,640	295	11,500	4.77	4.88
Other	320	-976	10,000	4.50	5.62
Total	11,810	611	10,400	4.32	5.62

** Cumulative residential space by study year in the projects to be completed up to four years after the study year.*

The vital nature of public-sector actors in the develop-and-hold residential segment in Munich is evident in the ranking of top actors as well. City (Gewofag, GWG, city of Munich) and state (Stadibau) housing companies remain in the first four places. The also state-affiliated BVK and the student union (Studentenwerk) assigned to the city of Munich (fifth and sixth) are public-sector actors, too. Places seven to nine in the ranking are then occupied by private-sector companies: Deutsche Wohnen, Dawonia, and Vonovia/Buwog. Deutsche Wohnen was able to gain a foothold in the Munich market with the acquisition of some former Isaria projects. BayernHeim, which took tenth place, in turn is a public actor, a state housing company represented in Munich with MCGraw-Kaserne and the Living Isar project.

Develop-and-hold residential projects – Top actors by housing units in study year 2021* in Munich



** Cumulative residential space by study year in the projects to be completed up to four years after the study year.*

1.3.7 Stuttgart

In the state capital of Baden-Württemberg, Stuttgart, nearly 3,800 housing units are being constructed as develop-and-hold projects;[42] this is 1,200 units more than expected in the previous study. Along with Munich and Berlin, Stuttgart is therefore one of the cities that has seen growth in the develop-and-hold segment. An additional 3,200 housing units are added by the conventional develop-to-sell approach. Both in the develop-and-hold and develop-and-sell segments, this is by far the lowest figure out of the seven Class-A cities. The developments thus analyzed in Stuttgart are determined by the city's limited space for expansion and its location in a valley. A fairly substantial portion of residential construction takes place in the areas directly adjacent to Stuttgart. In Stuttgart alone, an average of 1,400 housing units are being developed, and the actual housing demand in the city itself amounts to $2,600 per year. Stuttgart therefore has a strong mismatch between supply and demand.

The top actor in Stuttgart is the state-affiliated Stuttgarter Wohnungs- und Städtebaugesellschaft (SWSG). This puts the share of public-sector companies in the Stuttgart develop-and-hold residential segment at 72 percent, the highest share among all Class-A cities. Recently, SWSG has also considerably stepped up its project development activities and therefore contributed materially to the volume growth of the develop-and-hold segment. The housing construction

Develop-and-hold residential projects in Stuttgart – Housing units by development status in study year 2021* by type of actor

	ABSOLUTE NO. OF HOUSING UNITS	
	Actual 2021*	Change 2020-2021*
		Absolute
Cooperative		
Under construction	220	30
In the planning stage	550	290
	770	**320**
Church-affiliated		
Under construction	90	90
In the planning stage	140	-10
	230	**80**
Public sector		
Under construction	340	-80
In the planning stage	2,340	920
	2,680	**850**
Private sector		
Under construction	60	60
In the planning stage	-	-130
	60	**-70**
Other		
Under construction	-	-
In the planning stage	-	-10
	-	**-10**
Total		
Under construction	730	120
In the planning stage	3,020	1,060
	3,740	**1,170**

** Cumulative residential space by study year in the projects to be completed up to four years after the study year.*

42 This is the number of housing units completed between 2021 and 2025; projects whose duration is longer than 2025 are included proportionately.

cooperatives in Stuttgart's develop-and-hold segment, measured by project volume, came in second at 21 percent. Private-sector companies hardly pursue the develop-and-hold segment at all in Stuttgart: Only two percent of housing units in this segment currently come from private-sector companies. Specifically, this relates exclusively to Deutsche Wohnen, which took over the Rosenstein Trio project from Isaria and is now developing it independently for the portfolio in Stuttgart. Commercial use is primary there, but apartments will also be added.

Based on this growth in the project volume and the general increase in rents and prices, the theoretical market value[43] in Stuttgart's develop-and-hold segment also rose for almost all groups of actors. One exception is private companies, whose project volume was already low in the prior study[44] and decreased again. After Munich and Berlin, Stuttgart has the highest theoretical market value per square meter.

Develop-and-hold residential projects in Stuttgart – Market values in study year 2021* by type of actor

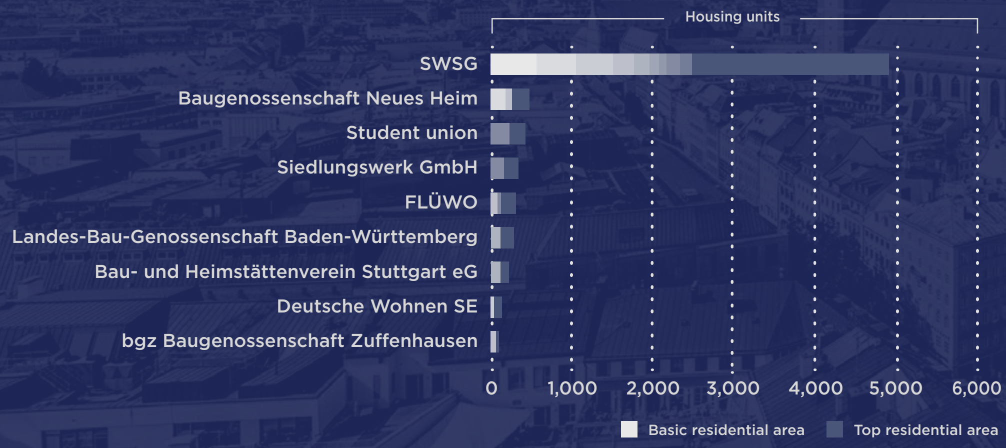
	MARKET VALUE 2021			AVG. RESIDENTIAL AREA	
	In EUR million	Change 2020-2021*	EUR/m²	2021	2020
Cooperative	320	161	5,600	4.04	3.79
Church-affiliated	140	62	7,700	5.50	5.33
Public sector	1,040	344	5,900	4.10	4.16
Private sector	20	-44	7,000	4.00	4.50
Other	-	-4	-	0.00	4.00
Total	1,520	519	6,000	4.22	4.00

** Cumulative residential space by study year in the projects to be completed up to four years after the study year.*

The develop-and-hold residential segment in Stuttgart is very small, and projects can currently only be allocated to 13 different actors. For years now, SWSG, a public-sector housing company, has dominated the segment, even though its market share dropped slightly recently. Besides SWSG, the student union and housing association (Siedlungswerk) are other public-sector institutions represented in the ranking. With Deutsche Wohnen, a private company is among the top ten in Stuttgart, too. All other places in the ranking are held by housing cooperatives.

43 For details, see the Glossary.
44 Develop-and-Hold Study by EMPIRA, November 2020.

Develop-and-hold residential projects – Top actors by housing units in study year 2021* in Stuttgart



* Cumulative residential space by study year in the projects to be completed up to four years after the study year.

Chapter 2

Focus Topic – ESG and Residential Real Estate

1. Sustainability and ESG in the real estate business – motivation, regulations, change – a short overview

Sustainability is nothing new

The topic of sustainability is nothing new, not in the real estate business, and especially not in Germany, the cradle of sustainability as a concept.[1] In the German real estate market, sustainability has been an integral part of regulatory standards and processes for several decades now. A notable example is that environmental protection has been a central theme of public construction law in the German Building Code (Baugesetzbuch – BauGB) since 1976 and has been continually expanded ever since. Environmental impact assessments (EIAs) have been required for large-scale building projects since 1990. The EIAs and the supplementary strategic environmental assessments (SEAs) are governed by the Environmental Impact Assessment Act (Umweltverträglichkeitsprüfungsgesetz – UVPG). In 1994, environmental protection was enshrined as a governmental goal in Article 20a of Germany's Constitution.

Environmental protection and climate action are also incorporated into many different laws on power generation and energy: The Energy Conservation Act (Energieeinsparungsgesetz – EnEG) was enacted in Germany in 1977.[2] Energy performance certificates (Energieausweise)[3], which were introduced in 2007; the requirement to obtain energy consulting; and legal regulations concerning renovations, insulation, and heating quality[4] also directly affect the real estate industry. In addition, any number of other new and amended laws promote sustainability measures and decisions in the real estate market. For instance, the most recent amendments to the German Home Ownership Act (Wohneigentumsgesetz – WoEigG) enable renovations to improve energy efficiency to be carried out more quickly and easily and establish the right to install charging stations for electric vehicles. The German Renewable Energy Sources Act (Erneuerbare-Energien-Gesetz – EEG), which entered into force in 2000, governs the feeding of renewable energy into the power grid.

A law on sustainability currently very frequently discussed is the Climate Protection Act (Klimaschutzgesetz) adopted in Germany in 2019. It is based on the EU's Paris Agreement on climate change and stipulates annual targets for the greenhouse gas emissions permitted for transportation, agriculture, and buildings. In this way, Germany aims to achieve climate action goals and comply with European targets. One component of this Act is carbon pricing, which is also becoming very relevant in economic terms. Previously, this applied to players in energy-related and energy-intensive industries[5] and was handled by way of EU emissions trading. In 2021, carbon pricing was also rolled out on buildings and in the transportation sector. This entails an additional tax paid on all fossil-based energy sources that result in carbon emissions, i.e., gasoline, diesel, heating oil, and natural gas. The current carbon price determines the amount of the tax to be paid. In 2021, it totaled EUR 25 per metric ton[6] and will be increased gradually over the coming years. Because the carbon tax is also passed on to tenants in the building sector, for instance, the

1 See, e.g. (in German): https://www.bpb.de/apuz/188663/was-ist-nachhaltigkeit-dimensionen-und-chancen.
2 E.g., the Energy Conservation Act was enacted in Germany in 1977. In the meantime, it was merged with the Energy Conservation Regulation (Energieeinsparverordnung – EnEV) into the Building Energy Act (Gebäudeenergiegesetz – GEG) in 2020, which now aims for energy conservation in buildings, while at the same time encouraging the increasing use of renewable energy. The introduction of the Energy Conservation Regulation established an instrument governing energy and climate action policy in Germany as early as 2002. One of the federal government's key energy policy goals even at that time was to make Germany's building stock as close to climate-neutral as possible by 2050.
3 Introduced as part of the Energy Conservation Regulation in 2007.
4 According to the current version of the Building Energy Act.
5 To date, these have been power utilities, plants in energy-intensive industries, and intra-European air transportation.
6 The national emissions trading system (nEHS) went live in 2021 and features a fixed-price system, i.e., the price per metric ton of CO_2 is specified by legislators. In this process, certificates are sold to companies that sell heat sources and fuels. The costs of the certificates is therefore borne by the fuel industry: Companies selling heating oil, (liquefied) natural gas, coal, gasoline, or diesel require an emissions certificate for each metric ton of CO_2 that these fuels emit when used. The German federal government and states agreed in the Mediation

carbon price will have not only a direct impact (private transportation) but also an indirect impact (via higher rents) on private households and other companies. This measure will therefore have a very broad effect.

Not only regulations, but also incentive systems

These regulatory requirements have long been supplemented by financial incentives, specifically with regard to buildings and particularly in the case of investments in the residential real estate segment. This type of financial support often focuses on optimizing energy efficiency and heating systems as well as reducing the electricity used by properties. Established for decades now, the subsidies offered by KfW are an important factor in the real estate market. They were restructured in June 2021 and combined with the grants provided by the Federal Office of Economics and Export Control (Bundesamt für Wirtschaft und Ausfuhrkontrolle – BAFA). These funds can now also be obtained from KfW as part of the Federal Funding for Efficient Buildings (Bundesförderung für effiziente Gebäude – BEG) program. In this context, the amount of the subsidies was increased considerably and the pool of potential recipients expanded: Besides residential buildings, grants are now also extended for non-residential buildings, and the subsidy option increasingly allows municipal or non-profit actors to take advantage of this financial support.

Not only regulations, but also incentive systems

The regulations and incentive systems in place to date have clearly concentrated on the environmental aspects of sustainability in line with climate action efforts. However, social aspects have also been regulated for a long time now in the German real estate market, although the connection to sustainability may not be directly apparent. In the case of residential properties, included are local ordinances regarding socially responsible housing policy, which can set guidelines such as the number of publicly subsidized housing units required in new construction projects and request that developers invest in public infrastructure, for example. Social aspects also include various legal regulations regarding rent[7] and the quality of indoor environments.[8]

What is ESG anyway?
The three-pillar system of sustainability

Viewing things in three dimensions is essential in the world of sustainability. This is known among experts as the three-pillar system of sustainability. These three pillars include the environment as well as social concerns and economics/business management. The EU explicitly defined this model in the Treaty of Amsterdam in 1997 and highlighted sustainability as an important accomplishment in environmental protection, and in business, politics, and society. The initialism "ESG" has been in use for this sustainability approach at the very latest since adoption of the EU action plan on financing sustainable growth in 2018: ESG = environment, social, governance.

Committee to initially set the carbon price at EUR 25 per metric ton starting in January 2021. According to this agreement, the price will increase gradually to up to EUR 55 per metric ton of CO_2 in 2025.

7 Even during World War I, Germany passed emergency rent regulations covering issues such as protection against termination and rent controls, and authorized government agencies to intervene to fill vacant properties. These emergency regulations and later state housing controls gave rise to socially responsible tenant law in the 1960s, mainly as part of the German Civil Code (Bürgerliches Gesetzbuch – BGB). Caps on rent increases are the most recent development.

8 E.g., in the German Workplace Ordinance (Arbeitsstättenverordnung - ArbStättV) or in the German Federal Environment Agency's (Bundesumweltamt) indoor air guide values.

Three-Pillar System of Sustainability – Now ESG

E Environmental*	S Social	G Governance
Climate change mitigation (CO_2, etc.)	Labor conditions and standards	Human rights
Climate change adaptation	Protection of health	Anti-bribery
Sustainable use and protection of water and marine resources	Corporate citizenship	Anti-money laundering
Transition to a circular economy	Civic engagement	Anti-corruption
Pollution prevention and control	Product stewardship	Compliance
Protection and restoration of biodiversity and ecosystems		Fair business practices

** here the six environmental goals in accordance with the EU Taxonomy*
Information on the subject of ESG – ESG competence group, bulwiengesa AG

Sustainability at the European level

When it passed the Federal Climate Change Act (Bundes-Klimaschutzgesetz – KSG), Germany's federal government began to implement a range of current EU treaties and regulations on sustainability. The EU has been actively dealing with the issues of climate action and environmental protection for several decades now.[9] Earlier examples relating particularly to the real estate industry are the harmonization of environmental impact assessments (starting in 1985) and the EU's Green Building Initiative (2005).

The European Commission then began to address sustainability at the company level with a Green Paper on corporate social responsibility (CSR) in 2001. More specific guidelines regarding sustainability at the company level were formulated in the directive on CSR in 2014[10], including the requirement for certain capital market companies to issue non-financial reports (Non-Financial Reporting Directive – NFRD). These were not defined very concretely at first, and the companies in question could apply national, European, or international guidelines , or offer explanations as to why they did not apply them.[12] The CSR Directive is therefore being amended[13] by the Proposal for a Corporate Sustainability Reporting Directive (CSRD), which aims to correct various deficiencies and broaden the range of companies that are required to apply it.

Europe's approach to sustainability became significantly more important with the adoption of the Paris Agreement on climate change and the passing of the UN Agenda 2030 on sustainable development in 2015. The 17 Sustainable Development Goals (SDGs)[14] defined in the UN Agenda in turn make up the core of the 2018 EU Action Plan for Financing Sustainable Growth[15]. This Action Plan aims to redirect capital flows toward sustainable business, to require sustainability to be incorporated into risk management, and to promote transparency and a long-term orientation.

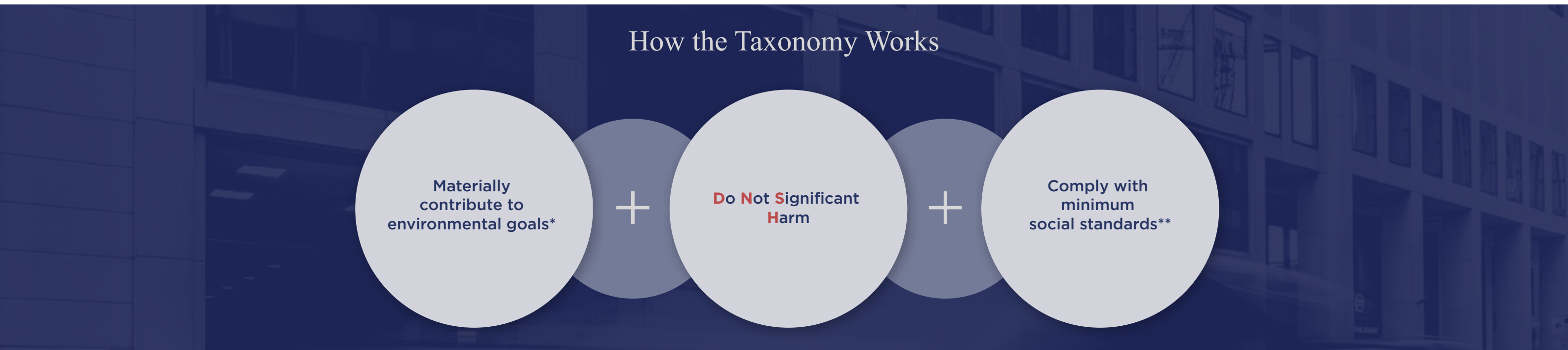
9 Of course, both social and economic sustainability have long played an important role in the EU and are also modeled in various guidelines and standards.
10 This Directive was transposed into German law by the Bundestag in 2017.
11 Various standards serve as a framework for systematic, thorough reporting, depending on the industry, company size, and strategic goals. The most important international framework was developed by the Global Reporting Initiative (GRI), a non-profit, multi-stakeholder initiative. Others include the German Sustainability Code (Deutsche Nachhaltigkeitskodex – DNK) and the minimum standards of the UN Global Compact.
12 Ultimately, this directive was not satisfactory. Information from the reports was criticized by users as not being relevant enough, often being unreliable, and being comparable only seldom, therefore being unsuitable for addressing the sustainability-related risks of investments. Moreover, the group of companies required to issue the reports was too small. In April 2021, the Proposal for a Corporate Sustainability Reporting Directive (CSRD) was published as a draft proposal. This amends the existing CSR Directive with the intention of harmonizing its inconsistent reporting requirements and increases the number of companies required to report (those with 250 or more employees), regardless of whether they are listed on a stock exchange or not. It also introduces an audit requirement.
13 The process is still underway.
14 Sustainable Development Goals.
15 This action plan ultimately aims to define which economic activities are sustainable and to channel capital into sustainable investments.

It was and is the source of several pieces of EU legislation. Some of this legislation is directly and indirectly very relevant to the real estate market:

Impact of European legislation on the real estate market

As early as 2019, the EU supplemented the Non-Financial Reporting Directive (NFRD) with the Sustainable Finance Disclosure Regulation (SFDR).[16] The companies covered by this regulation must now explain the extent to which their products and the company itself are subject to sustainability risks and the degree to which sustainability aspects play a role in their investment processes (Principal Adverse Impacts on Sustainability (PAI)[17]). They also have the option of labeling their products that pursue particular sustainability goals (Article 8 or Article 9 funds) and are required to label products that do not do so (Article 6 funds).[18] However, labeling funds as Article 8 or 9 funds obligates companies to comply with special transparency and reporting duties. The SFDR distinguishes between company- and product-based duties of transparency, requires implementation and publication of a sustainability due-diligence policy, and stipulates publication of the company's and product's environmental and social characteristics. Detailed information on the relevant characteristics and the procedure as well as suggestions for implementation are outlined in the report issued in 2021 on the Regulatory Technical Standards (RTS)[19]. These are intended to help companies present Article 8 and Article 9 information in a harmonized way and also contribute to ensuring that the companies required to report present relevant information. The RTS lists 14 mandatory indicators and another 24 optional indicators (two of which must be reported).[20]

In 2020, the environmental Taxonomy Regulation was passed additionally. This defines uniform criteria for a classification system for determining the degree of environmental sustainability of an investment. Selected companies[21] are required to report starting in 2022 on the sustainable (Taxonomy-aligned) share of their annual revenues, their capital expenditure (CapEx), and their operating expenditure (OpEx) – i.e., of their economic activities. In short, economic activities are considered sustainable if they (1) contribute to at least one of the total of six environmental



** Climate change mitigation, climate change adaptation, sustainable use and protection of water and marine resources, transition to a circular economy, pollution prevention and control, and restoration of ecosystems and biodiversity*
*** OECD Guidelines for Multinational Enterprises, UN Guiding Principles on Business and Human Rights, ILO Declaration on Fundamental Principles and Rights at Work, Universal Declaration of Human Rights, compliance with technical assessment criteria*

16 It entered into force in March 2021 and is applicable to financial market participants with more than 500 employees from June 2021 for company-related information and from December 2022 for product-related information.
17 In accordance with Art. 4 of the SFDR, the Principal Adverse Impacts on Sustainability (PAI).
18 The SFRD therefore requires product-related transparency regarding their environmental and social characteristics when advertising products in pre-contractual information (Art. 8 SFDR products) and when advertising products as sustainable investments with a positive impact (Art. 9 SFDR products). Of course, non-sustainable investments are still permitted if they include an explanation of this fact (Art. 6 SFDR).
19 Final Report on draft Regulatory Technical Standards RTS, February 2, 2021.
20 Regarding real estate portfolios, the companies concerned must disclose, e.g., the share of real estate investments that have any association with extracting, producing, or transporting fossil fuels and the share of energy-inefficient properties. Companies can optionally report GHG emissions, energy consumption, water usage, the proportion of rare materials used for new construction and renovations, or the share of developed space in their real estate portfolios.
21 These are companies that are obligated to publish a non-financial group statement or group report.

goals[22] defined in the Taxonomy, without (2) significantly adversely affecting the other goals (Do No Significant Harm, or DNSH rule)[23]. The activities must also (3) meet the minimum requirements for governance and social criteria (human rights, labor rights).

The Taxonomy uses the Technical Screening Criteria (TSC) to determine the extent to which an economic activity contributes to an environmental goal. The TSCs have initially been defined for the first two environmental goals, climate change mitigation and climate change adaptation. Currently, a large number of TSCs are available for nine economic sectors. The following TSCs are relevant to the construction and real estate markets at this time:[24]

- For new construction:
  - Buildings must use at least 10% less energy than the lowest-energy buildings required by applicable national law[25].
  - If a building is larger than 5,000 m², the building density and thermal properties must be reviewed, and the potential greenhouse gas emissions must be calculated for its entire life cycle (life cycle assessment).
- For (major) renovation projects: In the case of building renovation projects, the primary energy requirement for the property must be at least 30% lower, or alternatively, must comply with the national law implementing the EU Energy Performance of Buildings Directive. In other words, "major renovations" in Germany must adhere to the provisions of the Building Energy Act (GEG)[26].
- For individual projects to improve energy efficiency: All measures to insulate a building's envelope are applicable, including replacing windows, updating heating systems, and installing renewable energy technologies. Currently, individual renovation projects[27], the installation of renewable energy technologies[28] on site, and scientific and technical consulting activities are considered sustainable.
- The following rules apply to the purchase and subsequent maintenance:
  - Buildings constructed as of January 1, 2021, or later must meet the criteria for new construction.
  - All other buildings must fulfill the requirements of Energy Efficiency Class A or be classified within the best 15% of the national or regional building stock.[29]
  - The energy used by large non-residential buildings[30] must be reviewed and documented regularly.

22 See Article 9 of the Taxonomy Regulation; these include climate change mitigation, climate change adaptation, the sustainable use and protection of water and marine resources, the transition to a circular economy, waste avoidance and recycling, pollution prevention and control, and the protection of healthy ecosystems.
23 See Article 17 of the EU Taxonomy Regulation.
24 See Taxonomy Report: Technical Annex, March 2020, Section 8, p. 367 et seqq. It should be noted that the Taxonomy is still undergoing change. Criteria are being added for additional environmental goals, the extent to which social criteria are measurable is being considered, and discussions continue about the criteria already issued.
25 For Germany, this is KfW 75, or KfW 55 starting in 2023.
26 German Building Energy Act; this means a new heating system and renovation of at least 20% of the building's envelope.
27 E.g., installation of energy/thermal storage systems, installation of energy-efficient doors and windows, improvement of external insulation, setting-up of charging stations for electric vehicles, etc.
28 Solar installations, wind turbines.
29 Usable reference data is not yet available, however.
30 With heating/ventilation/cooling systems with output of 290 kW or more.

Some of the DNSH criteria also apply to buildings: For instance, water pollution and the non-sustainable use of water must be avoided during the construction phase and in the operating phase. This includes complying with a maximum water flow rate for typical plumbing systems. The inefficient use of resources in construction must also be prevented. This includes maintaining a high recycling rate of at least 70% of the construction waste generated. Potentially contaminated land must also be analyzed.

The Taxonomy is not yet complete with the TSCs currently in place. TSCs for the other environmental goals will be developed over the coming months. A social taxonomy is also being discussed currently to also address the "S" in ESG. In other words, the Taxonomy is still changing.

ESG activities in the EMPIRA Group's residential segment

The EMPIRA Group strives to do business for the long term – in social and environmental as well as financial terms – in order to meet the highest sustainability and ESG standards. On the one hand, that means that the company is committed to sustainability goals and sustainable business. On the other hand, the majority of EMPIRA's investment products and most development projects pursue ESG strategies or take into account sustainability criteria. The following are some highlights:

- The Empira Residential Invest (ERI) develop-and-hold residential real estate fund is certified as an Article 8 fund in accordance with the EU Disclosure Regulation. In the case of residential development projects, the aim is to meet the highest environmental and social ESG standards both at property level and when selecting investment locations.
- The company has developed a total of more than 3,000 housing units with over 200,000 m^2 of living space – and therefore made a valuable contribution to urgently needed housing.
- In this context, around 200 daycare spots, electric charging stations, and subsidized apartments in each case were created.

EU regulations could be interpreted even more strictly in Germany

In Germany, the Federal Financial Supervisory Authority (BaFin) is of the opinion that the EU's sustainability standards are sometimes too vague.[31] It appears that BaFin is planning stricter rules regarding implementation of the reporting requirement in the SFDR at national level and is working on its own guidelines:[32] In order to be able to label an investment vehicle sustainable, for instance, it would require at least 75 percent of the investments to be in sustainable assets. Thresholds would have to be met regarding the proportion of investments in certain industries. The investments would also be required to pursue environmental goals and adhere to the DNSH criteria.

In terms of social issues, a notable law is the German Supply Chain Due Diligence Act (Lieferkettensorgfaltspflichtengesetz - LkSG), which was passed in June 2021.[33] Supply chain regulations in other European countries are not yet this far advanced.

31 BaFin has issued a "Guidance Notice on Dealing with Sustainability Risks" in which including sustainability risks in risk assessments is defined as mandatory and which presents instructions describing how companies will have to take into account sustainability risks in the future.
32 As of: August 2021.
33 This will soon require larger companies initially to review and document the extent to which their supply chain activities adversely affect internationally accepted worker rights and environmental standards. If this is found to be the case, the companies must initiate countermeasures or face financial penalties.

Interview with
Johannes Kreißig DGNB

Johannes Kreißig, CEO of the German Sustainable Building Council (DGNB). The DGNB was founded as a non-profit organization in 2007 and is the market leader in Germany in the certification of sustainable buildings. In this interview, Johannes Kreißig explains how the latest EU regulations will affect the DGNB's certification systems and change requirements for residential real estate investments.

Mr. Kreißig, the DGNB recently introduced ESG verification in its certification system and therefore reacted to the growing list of EU regulations in this field. What will this verification process contribute?

Conventional sustainability certificates cover a broad range of sustainability issues, which are not all addressed by the new EU Taxonomy. At the same time, not every certified property is necessarily EU Taxonomy-aligned, simply because the content of the two systems is not completely harmonized yet. DGNB's ESG verification therefore focuses specifically on the content of the EU Taxonomy. After all, even if it's not required right now, we believe that the market will demand audited information in the foreseeable future. A confirmation by the borrower or a financial institution, for instance, will no longer suffice without an independent audit. Our ESG verification offers this type of neutral audit, which incidentally can also be requested without certification.

In your experience, how aware are housing developers of the importance of ESG at the moment?

The German market for residential development projects is very fragmented. For those of us who deal with institutional, and maybe even international investors, with private-sector property holders as end clients, sustainability certification for development projects is actually a no brainer – it's part of the deal. Several years ago, some private housing companies worked intensively on the issue of sustainability. The more international the company, the earlier they addressed this topic, whereas the German residential real estate market was still focusing exclusively on subsidies at that time. Today, sustainability is increasingly gaining a foothold among private-sector holders of residential property portfolios. In contrast, sustainability and green certification is often not much of an issue at housing cooperatives or other public-sector holders of residential property portfolios. Additional education is required in this segment to highlight the increasing relevance of the topic for reporting, since these companies will also be subject to mandatory reporting soon.

Has sustainability already become a quality seal in the housing segment that end investors want?

Definitely yes. On the institutional side, this is definitely something end investors already ask for. To the extent permitted by the information available today, they also require compliance with the EU Taxonomy.

What role do end users/small-scale investors play in this segment? Will this target group also feel pressure to "buy sustainably"?

Yes, this will happen. The companies that lend to this clientele are already taking action. For instance, we are currently in discussions with German savings and loans (Bausparkassen) to support them in developing audit processes for their small-scale loans to comply with the Taxonomy classifications. As soon as these end clients become aware that they can obtain less expensive financing for this type of product, the market will again change markedly.

Let's now turn to the social taxonomy currently being debated. Is it really an option for sustainable development projects to exceed the required number of subsidized housing units?

I'm a bit ambivalent on that. Without clarifying what affordability means, some of the goals of the social taxonomy will not be implementable. Of course, the basic principles behind the "S" in ESG are mandatory and non-negotiable. However, all socially relevant issues cannot be squeezed into the social taxonomy, or the requirements would get out of hand. My opinion is that it is fundamentally our obligation to implement social policy as social policy and, for example, provide the affected households with direct financial support so that they can obtain housing on the open market. Real estate cannot be a catch-all for every issue, and that is something I have long communicated to politicians as well. They are increasingly coming to understand that one too many expectations regarding social issues ultimately results in nothing happening.

What characteristics do you think residential development projects absolutely must have today to meet ESG requirements?

First of all, the development process for residential projects must definitely think through all activities regarding what the requirements will be in the course of 25 years. Climate neutrality must be there in the planning: That's a hard and fast requirement.
Secondly, with respect to quality, we have to act now to stop using construction products that we already know are problematic, for instance in terms of recyclability. That's true even if they are permitted and available at the moment. The circular economy along with pollution levels will soon be prioritized more highly, so decision-making processes must and will be adjusted, since awareness of these issues is growing.

What do you think about the current debate about stranded assets in connection with the EU regulations and ESG criteria?

Just because we are taking ESG criteria into account doesn't mean that basic market mechanisms have been suspended. Properties in the best locations in major cities will surely continue to be in demand. The cost and effort to market these will, however, increase in such cases, and the selling prices there will likely drop. This is nonetheless tolerable in markets like Munich, even in a portfolio. The picture is different in the many smaller, less profitable markets. There, a couple of these properties in a portfolio can in fact face difficulties when it comes to reselling them.
In the case of new construction, as I have already mentioned, developers will have to look very closely to see whether sustainable criteria must be fulfilled, regardless of the other criteria the property meets. Even if these properties will not all be equally close to climate neutrality, plans must be in place to make these buildings future-proof quickly. Planning practice will change in this regard, and this is something I expect to happen very

soon. The year 2050 is in the foreseeable future.

What specifically should holders of residential property portfolios keep in mind when it comes to compliance with ESG criteria?

Residential property holders usually do not hold truly future-proof portfolios. Large companies are aware of this problem, but currently they do not have solutions for all cases. Regarding development projects, major property holders are buying up developers, and the line between developers and property holders is blurring. This provides these housing companies with access to projects and allows them to raise the quality of these projects to a high certifiable level such as DGNB Gold.

As far as existing properties are concerned, there is currently no equivalent tool. Some property holders lack the transparency about their own buildings, for instance regarding water, heating, and energy usage, required to take appropriate action on ESG criteria. In this case, the political sphere must help and, in particular, settle the constantly recurring issue of data protection. Without data, it's impossible to take the right action.

The interview was conducted by Mrs. Ellen Heinrich (Head of Studies at bulwiengesa)

2. Sustainability in the residential real estate market – The developer and property holder situation

Sustainability in the real estate industry is taking off

More and more companies, particularly in the financial market, are being required to address sustainability in view of the aforementioned regulations. The dependence of the real estate industry on the financial markets and the stepped up reporting obligation to which many different kinds of companies are subject give rise in the medium term to the need for action on sustainability and ESG issues by other players in the real estate sector as well:

- Fund companies will have to report and buy differently, at least in part, to the extent that they wish to adapt their products to the increasingly sustainability-focused demand of institutional end investors. Through the possible launch of Article 8 and Article 9 funds, the impact of sustainability makes itself even felt in product structuring.

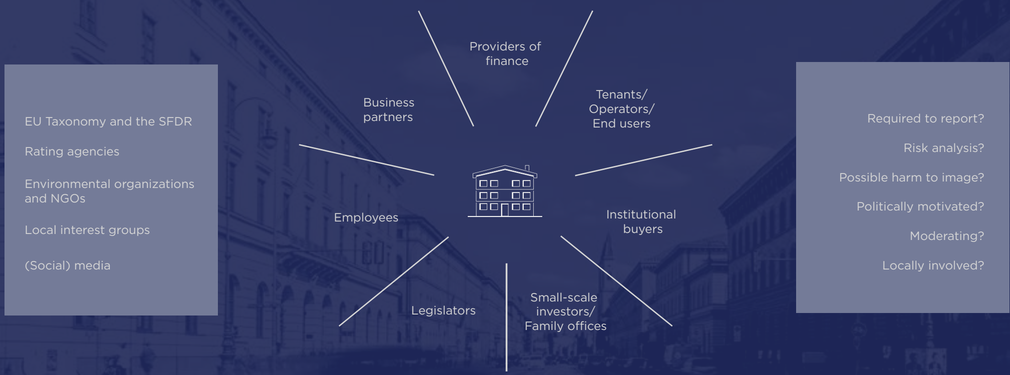
- Going forward, developers who fail to ensure the sustainability of their projects could see declining buyer interest and, in the medium term, quite possibly also larger risk premiums when obtaining financing. In this context, they currently face a dilemma: Making projects sustainable increases costs, but the reasons buyers are seeing higher prices are not yet being communicated to them clearly right now and are also not entirely unproblematic from a social perspective in often tight, high-priced real estate markets.

- And, of course, it will also be asset and facility managers specifically who have to deal with increasing transparency requirements and the search for potential to improve the sustainability of their properties. This in turn gives rise to requirements that development projects must fulfill (smart buildings, technical building management systems). In addition, this is expected to cause demand for renovation of existing buildings to grow.

Demands on the sustainability of buildings can also come from not only providers of finance and buyers but also from end users. In the housing market, these would be players such as micro-apartment operators, who can also be subject to reporting requirements.

What should not be forgotten is that the topic of sustainability affects the residential real estate market above and beyond the EU regulations as well. This expands the group of stakeholders who deal with this issue. Careful stakeholder analysis is therefore recommended for residential real estate projects.

Sustainability is relevant in residential development projects via various stakeholders



Source: Original text based on a presentation by Viola Raddatz at Alasco titled "ESG ganzheitlich denken – Die wichtigsten Regularien für Immobilienunternehmen" ("Holistic Approach to ESG – The Most Important Regulations for Real Estate Companies"), available in German online at https://www.alasco.de/blog/video-esg-ganzheitlich-denken-die-wichtigsten-regularien-fuer-immobilienunternehmen/.

Sustainability and residential real estate development projects – current status

Despite current developments, it appears that the issue of sustainability is not yet having an impact on financing, particularly for residential development projects: No risk premiums are being charged yet on financing for non-ESG-compliant properties. This trend is expected in the medium term in the institutional real estate market, however. Further in the future, even owner-occupants and small-scale investors in the residential real estate segment may face higher risk premiums when borrowing money for this purpose.

Selected groups of institutional clients of project developers are already actively engaged in ESG issues.[34] Currently, available products are increasingly being screened using ESG criteria in line with the reporting requirement already in effect at company level and growth in the structuring of Article 8 products. This pattern is further bolstered by a general trend among institutional in-

34 It should be noted that sustainability has generally been relevant to selected financial market players for many years now. Examples are traditional Swiss banks such as Bank J. Safra Sarasin AG as well as Pictet, Die Erste Asset Management (Austria), and Tempelton and Pioneer in the United States.

vestors toward sustainability[35]. The housing segment is particularly interesting in this regard. The COVID-19 crisis has thrust this segment into the spotlight. ESG issues additionally raise awareness of residential real estate as a potential investment, since this is an area where the social aspects of sustainability could potentially be implemented in interesting ways.

Though in the German market in particular, residential project developers have been relatively reticent to date on taking action regarding sustainability. This is due in particular to the demand situation, which is tight on the one hand and heterogeneous on the other hand. Green certificates, for example, or other "additional" sustainability activities have not yet been truly essential for successful market positioning. Moreover, end users, small-scale investors, and family offices are generally open to sustainability, but to date have rarely been prepared to pay more for sustainable products, and are not yet interested in ESG-focused assets.

Also in line with considerations regarding ESG-aligned real estate products are market concerns about stranded assets, i.e., buildings that cannot be sold. Development projects that will no longer be suitable for sale in the future should be avoided in the interest of avoiding such judgments. Although the industry does not expect such properties to be completely unsaleable, reduced prices are thought to be possible. This impact could be experienced more strongly by large properties, because these in particular are relevant for institutional buyers sensitive to ESG criteria. Whether the market will be divided as discussed right now in the industry remains to be seen. However, it should be noted in this context that to date sustainability or even Taxonomy alignment has only continued to be one of several characteristics of a project.[36]

Social components and impact investing by property holders

Holders of residential property portfolios have the advantage that they can and also must be especially actively involved in the social dimensions of ESG. These include potential measures such as committing to rent stability, providing social infrastructure, and promoting community and integration in residential neighborhoods. Although the Taxonomy does not yet include the requisite official criteria, these approaches to socially sustainable investing are increasingly being applied, particularly in international markets. Currently, end investors readily position themselves in the United States with corresponding impact investments and target the social components of ESG.

In view of the work and recreational activities of tenants in residential projects, neighborhoods are an issue that increasingly comes to the fore and offers considerable potential for sustainable environmental positioning if they feature short distances and less necessity for travel. In the ideal case, this type of neighborhood is located in a city center.

The Institute for Corporate Governance in the German Real Estate Industry (ICG), for instance, views affordable housing as well as sustainable neighborhood development as a future mission for impact investing. A well thought-out neighborhood development plan and corresponding management can have an impact at the target group level and the level of society as a whole, and one that is more comprehensive than that of purely residential projects.

35 Image considerations and the general societal trend toward sustainability play a key role here.
36 In Germany – unlike in other EU countries such as the Netherlands – there are currently no "hard" regulations on a lack of compliance with sustainability criteria that could make leasing impossible in the future.

Interview with

Prof. Dr. Steffen Metzner

Real estate economist (Immobilienökonom) and business administration specialist (Betriebswirt) Professor Dr. Steffen Metzner (MRICS) is the EMPIRA Group's Head of Research. In his most recent published study, he investigated how new residential construction affects the energy and carbon footprint of housing stock. He outlines the main results in this interview.

Prof. Dr. Metzner, you recently conducted a study on "New Housing Unit Construction for Sustainable and Energy-Efficient Housing Stock." What are your key findings?

First of all, major trends such as migration, changes in average per-capita space, and average household size will result in a further increase in the need for living space in Europe in the future.

Secondly, it will not be possible to meet this growing need for residential space with current housing stock, particularly not in metropolitan areas. New construction is therefore indispensable.

Thirdly, in addition to absolutely necessary and effective measures (if they are properly implemented) to reduce the carbon footprint of the existing housing stock, it is essential to implement measures to shrink the carbon footprint of the required new housing to be built. In the ideal situation, this would, of course, happen along the entire value chain.

Fourth, the good thing about new construction projects is that the leverage effect of energy savings at the project level is enormous in relation to the costs, much greater than in the existing housing stock. This is particularly true for Germany, where the age of existing buildings is above average.

Fifth, these projects can best be undertaken by private-sector actors in the residential segment, because they have more capital and liquidity than conventional public-sector, non-profit, or cooperative players. Thanks to the new Building Energy Act, these will be able to access subsidies more easily. However, private-sector companies can still additionally benefit from increasing financial market demand for ESG-based investments.

Does that mean that constructing new housing is more sustainable than renovating existing buildings?

Yes, due to the lower directly measured carbon emissions generated by new construction, this is most definitely our position! In fact, the study mainly analyzed the Scope 1 effects of directly reducing CO2 emissions, in other words, the effects most quickly and effectively measured. ESG criteria are applied very concretely in new construction. In existing buildings, in contrast, this is possible only in part and only with delays, except in the case of complex and costly reconstruction projects.

Of course, the analysis becomes more complex if the other Scopes are considered. It is undoubtedly true that, for a short while, a new building has a larger carbon footprint than the renovation of an existing property with its basic structure and substance still in acceptable condition. Ultimately, an investment must be economically reasonable, efficient, and feasible in all respects. How do ESG-compliant properties help regions experiencing population declines? The question of replacing or improving older housing stock in locations that are generally still popular is somewhat remi-

niscent of the bird in the hand.
The capital market, which demands ESG-focused products, will also play a key role. New construction rather than the renovation of existing buildings will be the clear focus here. After all, the direct sustainable effect of energy savings in new buildings is nearly twice that of a complete renovation project. These metrics are important to investors.

So, you see strong potential in private-sector housing companies especially implementing these requirements in new housing construction?

Yes, exactly. The measures necessary, for example, for a zero-carbon property, a green building, or a Taxonomy-aligned economic activity are expensive. Private-sector actors are more likely to have this capital available to them than public-sector companies or even the many non-profit and cooperative housing companies. For this reason, it would be very welcome if politics could offer these private-sector players a more attractive environment for creating new, energy-efficient residential properties.

What could this type of environment look like in your opinion?

For example, parcels of land could be handed over to private-sector companies more quickly and inexpensively. The availability of land for construction is, of course, a major problem generally and would be a powerful lever, just like enabling efficient building, in-fill development, and streamlined processes, to name a few examples. Subsidies are now more widely available to all actors via the Federal Funding for Efficient Buildings program, which is a good thing. We should keep an eye on the regulations concerning the test use of new materials to ensure they do not slow things down. In terms of mobility, with the right concept, more flexible approaches to parking would undoubtedly also be very effective, because this is a way to quickly and sustainably cut costs. It's important for municipalities to remain open to new ideas.

The interview was conducted by Mrs. Ellen Heinrich (Head of Studies at bulwiengesa)

Glossary and explanations

Research and universal set of this analysis

In the third Develop-and-Hold Study by EMPIRA the volume of the develop-and-hold housing project developments in the seven A-cities is identified and evaluated.

The universal set for the data analysed in this study is as follows: All of the projects in the required data set which may be researched

- with completion in the years 2021 bis 2025
- with an address within the A-cities (clearly demarcated by municipalities),
- with project land owned by the ranked company,
- which are in concrete planning or already being implemented,
- with a living space of at least 1,000 sqm,
- which are at least a comprehensive refurbishment (not a so-called superficial renovation/pseudo retrofit, not a refurbishment while building is still occupied).

bulwiengesa uses various sources to research the projects and the respective actors, the planned project areas, the development status and construction period, the location and project name, and ultimately also the expected project strategy (trading-development or develop-and-hold).

The actors with a minimum living space of 5,000 sqm in development were allocated to the company types public, private, cooperative, church or social especially for this Develop-and-Hold Study by EMPIRA. All other actors with a smaller project area, as well as all projects whose actors are not known or are not 100% identifiable, are included in this study under the actor type “Other”.

In addition, the living spaces of the projects were recorded or calculated specially for this Develop-and-Hold Study by EMPIRA.

Meaningfulness of this analysis

With this definition of the universal set and the cut-off date the study offers a very good overview of the market for develop-and-hold project developments in Germany. This strict approach allowed for the creation of a valid data basis. Nevertheless, the following points should be borne in mind in the interpretation:

- Not included in the study are residential projects of less than 1,000 sqm, which are generally initiated by smaller project developers, construction clients or private individuals.

- A clear differentiation between trading-development and develop-and-hold is not always possible at project level. New information, yet also strategy changes at project/corporate level make such a classification fluid.
- The definition of the refurbishment projects taken into consideration excludes so-called superficial renovations/pseudo retrofits or refurbishment without any major changes in the construction quality.
- For the purposes of gathering data the necessary clear demarcation by municipalities "crops" the functional residential markets in some A-cities.

How are the projects allocated in the ranking?

In the ranking the projects were allocated to the actors as follows:

- Fundamentally exclusively all projects with a develop-and-hold strategy which fulfil the above criteria were taken into account here.
- The relevant unit for the ranking are the housing units.
- With a joint venture the housing units are allocated equally or insofar as known another distribution to the respective actor is used for the ranking.
- Some actors have been combined and assessed in the ranking under a group of companies.
- The important factor is: the plot of land has to be owned by the ranked company.

Classification of the locations

The 127 RIWIS locations have been sub-divided into four classes by bulwiengesa in line with their functional significance for the international, national, regional and local real estate markets.

- A-cities: The most important German centres of national and in part international significance. Large, functioning markets in all segments. E.g.: available office space (gross floor area) of more than 5 million sqm, average take-up of more than 100,000 sqm over many years.
- B-cities: Large towns of national and regional significance. E.g.: available office space of 1.5 to 4 million sqm, take-up of more than 35,000 sqm.
- C-cities: Important German towns of regional and limited national significance, of less significance, with a key impact for the surrounding region.

- D-cities: Small location with a regional focus and a key function for their immediate environs, lower market volumes and take-up.

The study exclusively considers A-cities
(with clear demarcation by municipalities).

Definition of trading-development

Projects are regarded as trading-development if a project developer functions as an intermediate investor for project developments from the purchase of a plot of land (possibly also the purchase of an ongoing project) through to completion with the objective of marketing the project. In this respect the projects are developed at its own risk and for its own account.

Definition of develop-and-hold

In the case of projects with a develop-and-hold strategy a company functions as an intermediate and end investor for its (own) project developments from the purchase of a plot of land through to completion with the objective of retaining the project for its own portfolio. In this respect the projects are developed at its own risk and for its own account with the intention of keeping the project in its portfolio.

Definition of service-development

Companies are regarded as service-developers if they are active as a service provider for concept development, consulting, management and marketing services. These companies conduct developments at the risk of and for the account of third parties and can serve trading-developers and investor-developers. Actors and information on service-development projects are not analysed in the study.

Lack of definition in the allocation

With the increase in the frequency of so-called forward deals, yet also with the increase in the depth of research, the question of the respective project strategy can now no longer be answered generally. Ultimately it is a question of the risk allocation in the project phase. Through the exchange of data with the project developers in the course of the bulwiengesa Project Developer Study the strategy allocation can be clarified quite well in the meantime. Nevertheless, a certain lack of definition is always to be expected, if only because such project strategies can change daily, both at project level and at the overall corporate level.

Explanations on the methodology theoretical market value model

For each of the analysed housing construction projects a theoretical market value is determined for 2021 and for the planned year of completion. This is based on the available information on the project size (with regard to the living space in sqm), a market rent for newly-constructed apartments derived from the residential location, and the gross multiplier for newly-constructed apartments:

Input variables: Project size and year of completion

The project size and the respective year of completion for the residential housing project are the result of an intensive research process, which combines bulwiengesa's desk research methods and a comparison of this information with the respective actor.

Input variable: Residential area quality

The residential area quality is an important parameter for land and apartment prices, as well as the local rent levels. In this respect information on the integration in urban planning terms, the sociodemographic environment and criteria specific to real estate are included in the model used to calculate residential location quality. These include:

- Desirability
  (volume of people moving into the area from further afield),
- Geographic embedding (proximity to parks and greened areas, distance from industrial areas),
- Building structure (apartment sizes new construction/portfolio),
- Population composition in the residential area (social status),
- microm-Statusvariablen (dominante Milieus, Typologie, Zahlungsindex),
- Microm status variables
  (dominant milieus, typology, payment index).

There is differentiation between the following four main categories:

- Very good residential area: particularly prestigious locations and areas with expensive villas close to city centres, as well as particularly sought-after residential areas
- Good residential area: residential areas which have traditionally been popular, typical urban "trendy districts", quiet residential areas with adequate to good infrastructure and a positive image
- Average residential area: areas without the drawbacks of simple residential areas and the benefits of good areas
- Simple residential area: remote residential districts with predominantly compact, dense housing, inadequate infrastructure and/or proximity to larger business parks, industrial areas or heavily frequented transport axes

There are also intermediate categories between these main categories.

The residential areas are available as information at both city block and urban district level. For city blocks without residential use, with predominantly commercial use, with fewer than five households and/or a park/greened area proportion > 80%, no residential area is designated. For the final derivation of the residential area quality the mean value of the residential area quality at city block and urban district level is chosen. In those cases in which there is no available residential area quality at city block level (for example with the development of new quarters) the value for the residential area quality of the urban district is used. In this study the resulting residential area qualities are applicable when deriving the customary benchmarks for new construction rents and multipliers.

Input variable: Market rent

The market rent for new housing developments is derived from the definition as used in bulwiengesa's own database RIWIS:

„Apartment rents are stated for first occupation (new construction and retrofit) and re-letting in euro/sqm of living space and apply ideally to an apartment with three rooms and with approx. 65-95 sqm of living space and standard facilities and fittings. As the fittings and size are standardised, the price range for rents fundamentally represents a variable which is influenced by the location and/or the micro-location. The stated rents are nominal values. Rents are recorded exclusive of ancillary costs and without taking into account other possible perks. Minimum, maximum and average values are stated for first occupation and re-occupation in each case. Minimum and maximum rents encompass the lowest and highest 3-5% of the market, from which a mean value is then derived. They do not correspond to the absolute top rents (defined as outliers). Average rents represent the mean value across the defined overall market."

This range of market rents at partial area level is
interpolated on the residential areas.

Input variable: Multiplier

The gross multiplier is based on the customary market definition as it is also used in bulwiengesa's own RIWIS database. Accordingly the multiplier corresponds to the inverse value of the gross initial yield.

"Gross initial yields are understood to be the ratio of the incoming rental income to the purchase price, without taking into account incidental costs (maintenance, incidental purchase costs, taxes and costs which clearly cannot be recovered from other persons). The rent is the rent which can be attained in the first year (viewed as of the point in time of the purchase). The multiplier is applicable to a purely residential property, approx. 20 years (old), at least six tenants, no package sales, no first occupation/complete refurbishment. As the fittings and sizes are standardised, the price range for rents is fundamentally represents a variable which is influenced by the location and/or the micro-location. Minimum, maximum and average values are stated. Minimum and maximum values encompass the lowest and highest 3-5% of the market, from which a mean value is then derived. They do not correspond to the absolute top multipliers (defined
as outliers). The average multiplier represents the mean value across the defined overall market."

This range of multipliers at partial area level is
interpolated on the residential areas.

The derivation of multipliers for newly-constructed residential properties is conducted by adding three years' rent to the respective multiplier for existing residential properties.

Manual adjustment with apartment projects

In the case of projects with average apartment sizes of less than 40 sqm of living space the initial calculated market rent is adjusted to take into account the customary significantly higher rent per square metre.

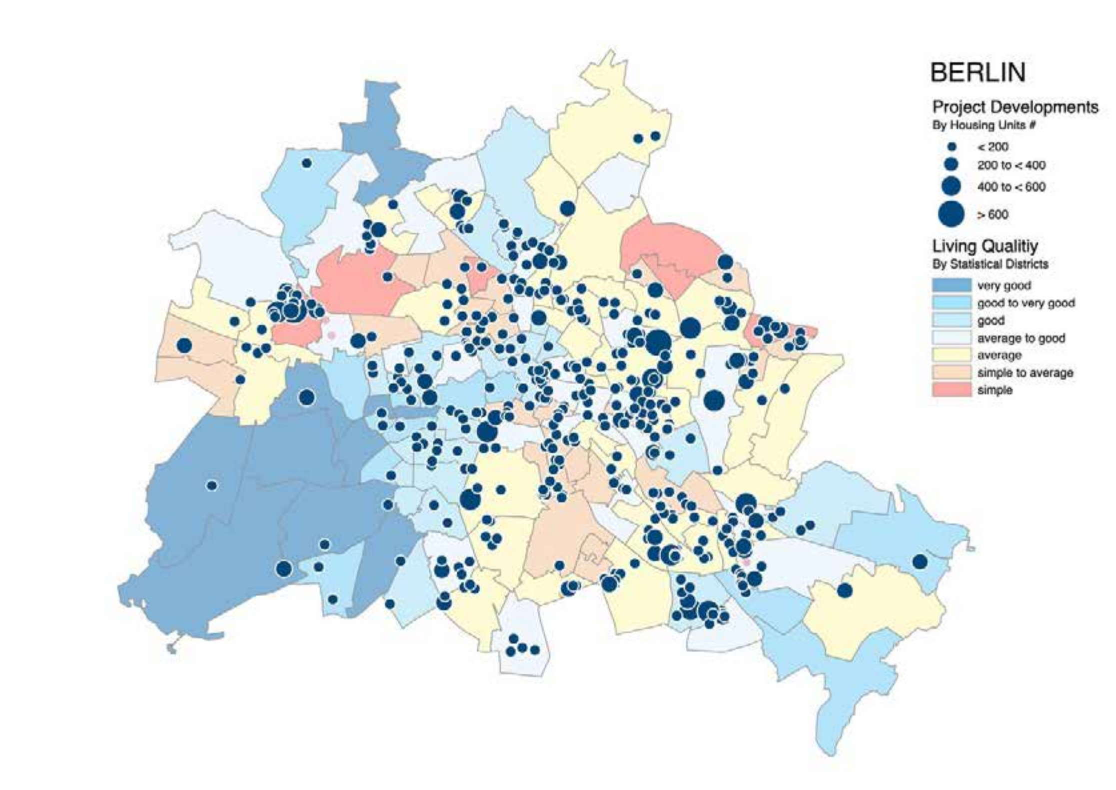
Result: Theoretical market value per housing construction project

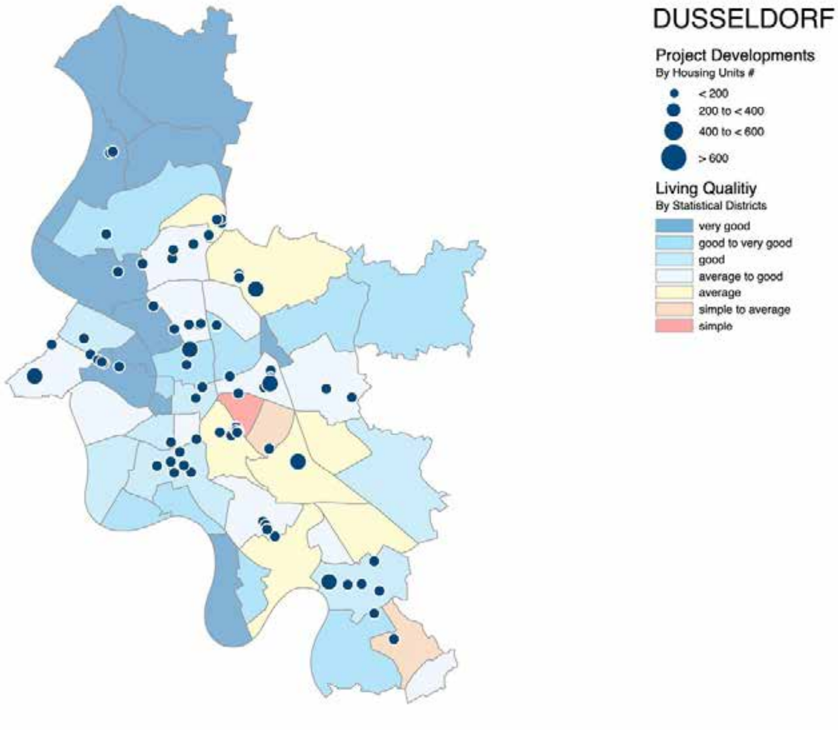
As a result of the above approach, for each analysed housing construction project there is a theoretical market value for 2021 and for the respective year of completion.

Please note: as the input variables are classical parameters for non-subsidised new housing construction, this theoretical market value may not be equated with a company-specific capitalised value or the like.

Residential area quality and project development of all seven german A-cities

- Berlin
- Düsseldorf
- Frankfurt/Main
- Hamburg
- Cologne
- Munich
- Stuttgart




DUSSELDORF
Project Developments
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Living Qualitiy
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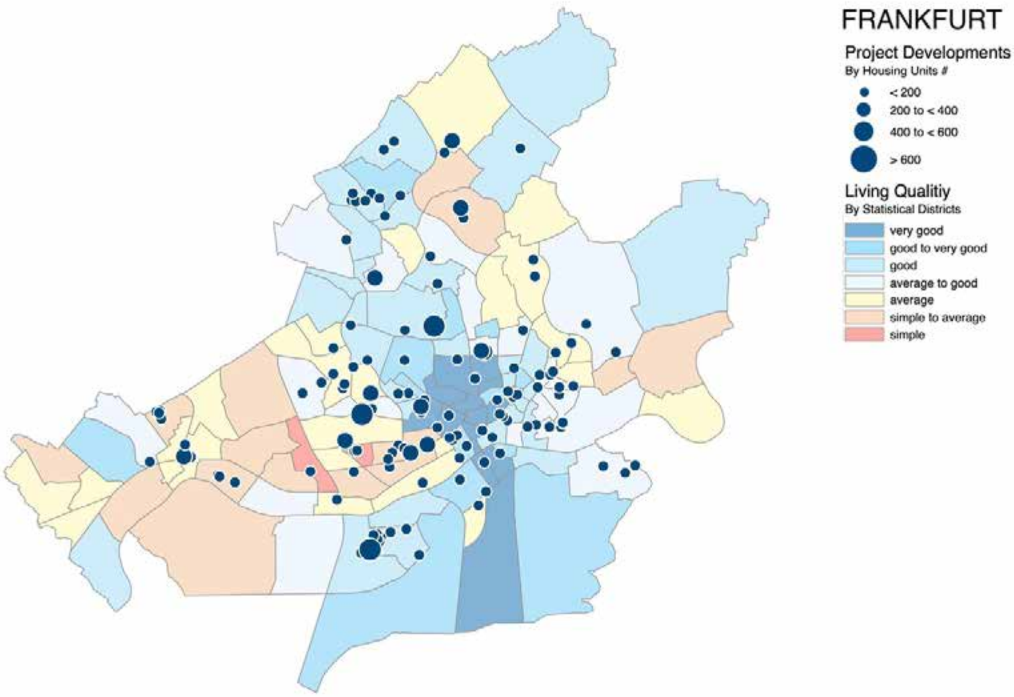
FRANKFURT
Project Developments
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Living Qualitiy
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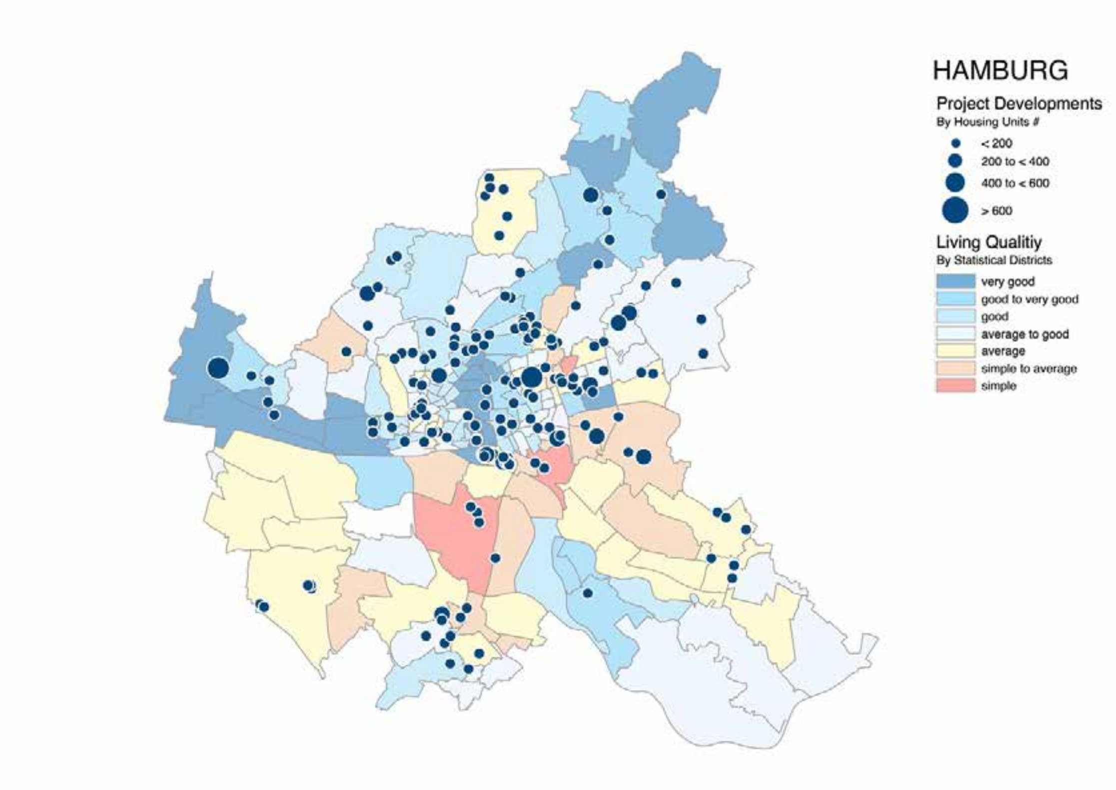
HAMBURG
Project Developments
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Living Qualitiy
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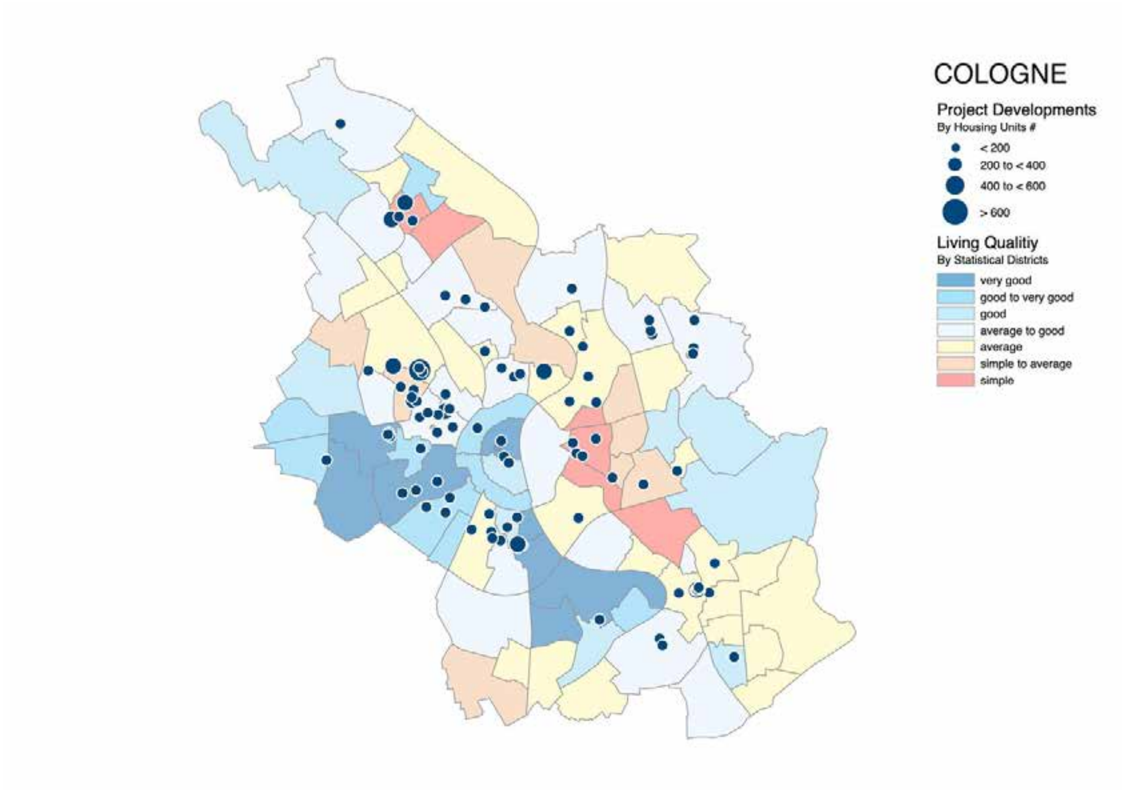
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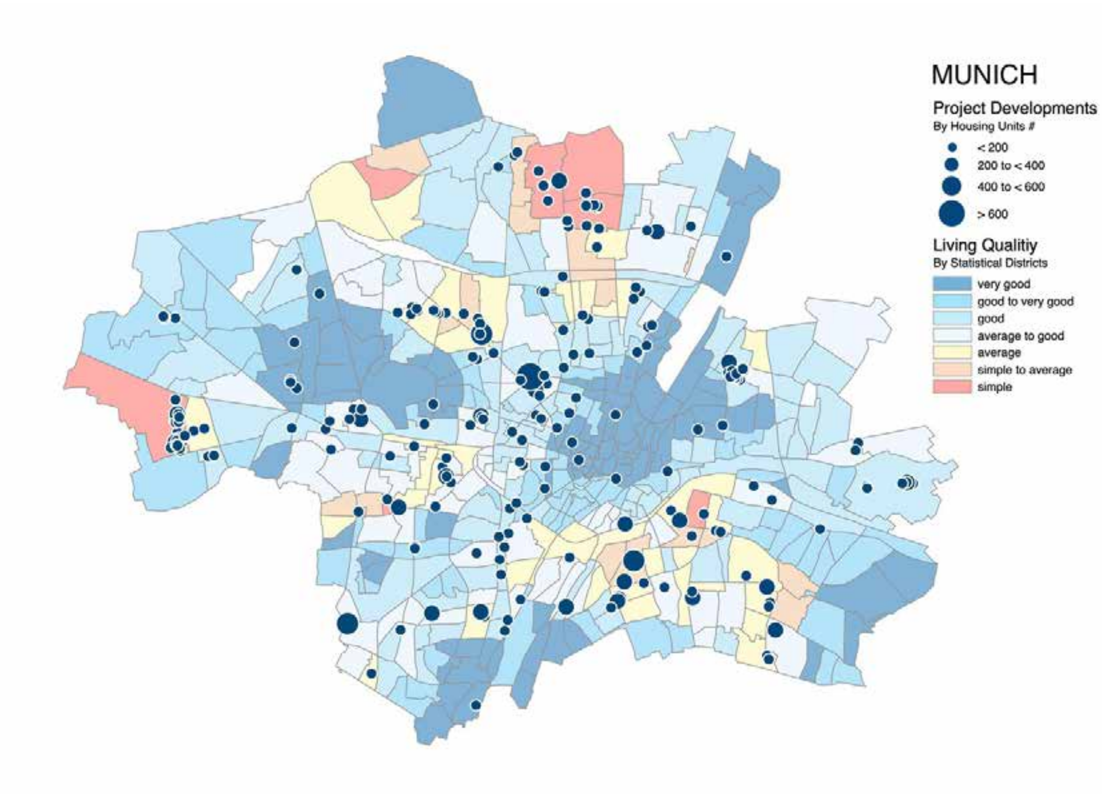
MUNICH
Project Developments
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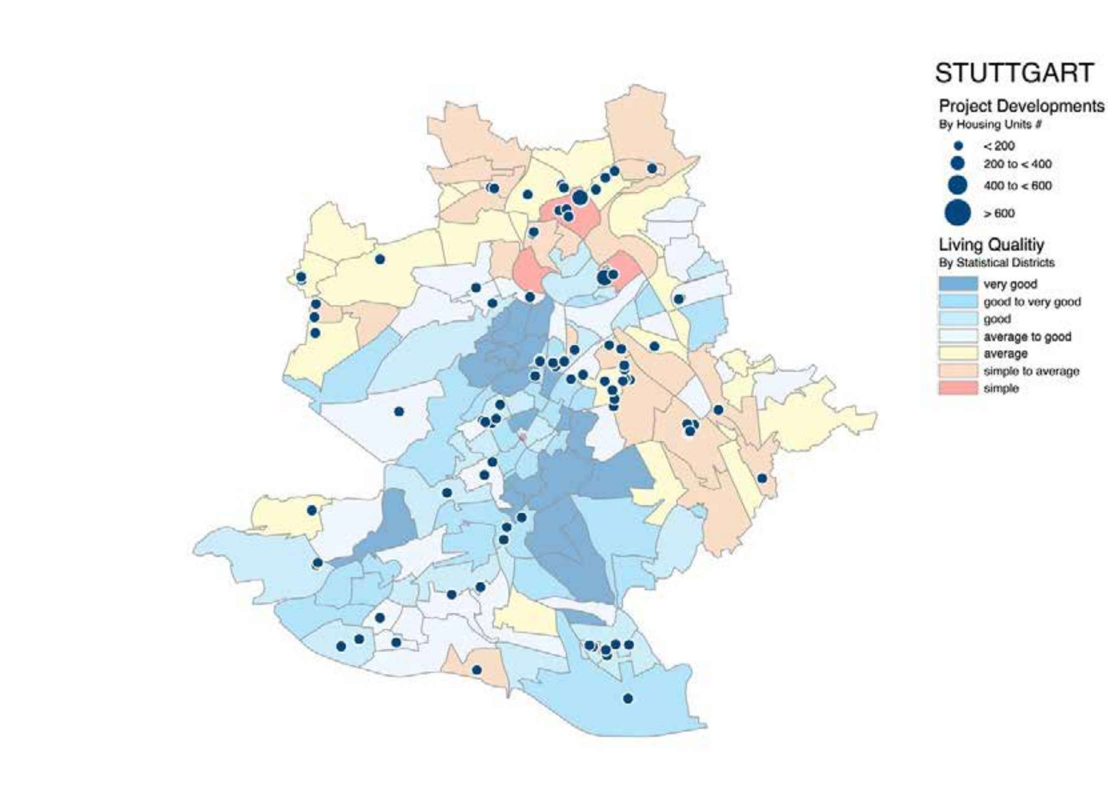
STUTTGART
Project Developments
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Living Qualitiy
By Statistical Districts
very good
good to very good
good
average to good
average
simple to average
simple

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