



NA Apollo

Life Science Germany

Fundamentals, trends, and outlook for the real estate market
2023

“Much as I Know, I wish I knew more.”

Quote from Johann Wolfgang von Goethe

If you require any further information, please do not hesitate to contact us. We can put you in touch with our specialists who are always happy to provide you with expert support. We look forward to hearing from you!



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Overview

- Global megatrends, such as the progressive ageing of the population, increased expenditure on research and development (R&D) and rising demand for medical care, are helping to bring about further positive advances in the life science sector.
- R&D spending in Germany amounted to around €101 billion in 2021, which corresponds to about 3.1 % of the gross domestic product (GDP). In an international comparison, Germany is ranked fourth worldwide in terms of absolute R&D expenditure. In a European context, it is also in fourth place regarding R&D spend as a proportion of GDP.
- The life science property market in Germany is a dynamic growth sector. In recent years, investments in property for the life science industry have significantly increased amid the rising interest in biotechnology, pharmaceutical and medical research, while the coronavirus pandemic provided additional impetus. The strong presence of companies from the life science segment in Germany, and the existing cluster structure including leading academic and research institutions, also ensures that investors, project developers and financial institutions will continue to increase their focus on Germany and the relevant property assets in future.
- Although awareness of the life science property segment is growing, there is still a lack of transparency in the market. This in turn makes it difficult to assess factors such as space take-up, rental levels and transaction volumes. According to our analysis, we estimate total property stock at about 21.2 million sqm in 2021 based on the average space per employee. The life science sector could require a further 1.7 million sqm of space by the end of 2024.
- Owing to the limited amount of data available, there are some occasions when it is only possible to make assumptions about both the investment and lettings markets in the life science sector. Market rental prices range between €12.00/sqm and €20.00/sqm depending on the age of the building, the quality of the property, the location, the tenants and the rental period, although rents can be significantly higher in new developments as well as in the case of user-specific infrastructure or amenities. The multiplier range for existing property is currently 14.00 to 23.00-times (depending on the quality of construction, building age, location, and credit-worthiness of the tenant). For project developments in prime life science locations, factors of more than 23.00 are possible, although this is heavily dependent on the current market environment and external factors. Based on these values, current life science property stock in Germany that is suitable for investment is estimated at up to €33 billion. Life science property is a sought-after investment because of its low vacancy rates and long rental periods, with a particular focus on new construction projects.

Primarily because of the Covid-19 pandemic, a number of different players have turned their attention to the life science industry in recent years. Indeed, along with the social discourse on matters such as vaccine development and production, property investors have become increasingly aware of life science as a distinct area. Other megatrends, such as progressive demographic change, rising expenditure on research and development and increasingly high demand for medical care within the population, will also ensure that the industry plays a key role in future.

Life Science in Germany

In Germany, a large number of companies and institutions are active in the life sciences field. These include pharmaceutical, biotechnology and medical technology companies as well as research institutions such as universities and colleges. These organisations often require specialised property to meet the needs of their respective fields of activity.

Life science property in Germany primarily includes laboratories and production facilities that are designed to meet the high demands of the industry. Such requirements include, for example, clean rooms with a controlled environment,

which are necessary for the production of pharmaceuticals and biotechnology products. Office and administration space, as well as warehouses and logistics properties, are also important components of the life science property market.

One example of a large innovation cluster with a life science research focus is BioRN in Heidelberg, which forms the Rhine-Neckar Life Science Cluster with a total of over 140 companies and institutions. Also worth mentioning is the Munich biotech cluster BioM, with around 340 biotechnology and pharmaceutical companies in the greater Munich area. Further examples are BIO.NRW, the biotechnology network in North Rhine-Westphalia, biosaxony in Saxony, HealthCapital in Berlin-Brandenburg and “Life Science Nord” in Hamburg and Schleswig-Holstein.

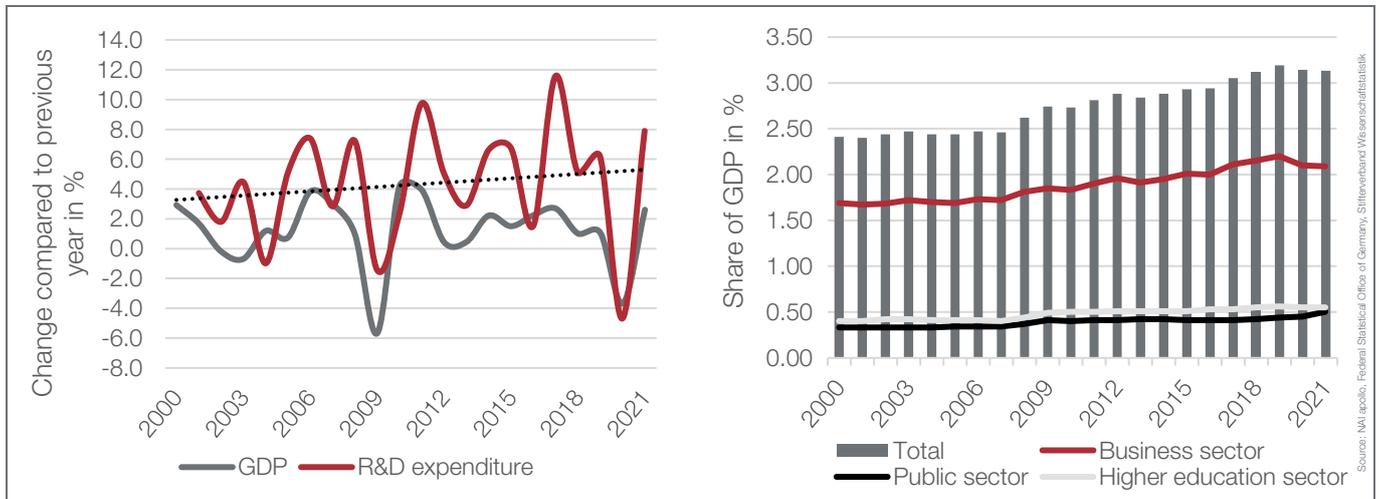
A close study of the research and development (R&D) field makes sense as it illustrates very well the dynamic development of the life science segment in Germany and includes numerous life science research priorities. R&D is defined as private and public activities in the areas of basic research, applied research and experimental development, which are undertaken in a systematic manner to deepen knowledge or to acquire new knowledge (cf. Federal Statistical Office, 2023).

Life Science Subdivision

Medical engineering	<ul style="list-style-type: none"> • Engineering in the field of medicine • Combination of technology and medical expertise for diagnostics, therapy, nursing care, rehabilitation, and quality of life
Biotech	<ul style="list-style-type: none"> • Application-oriented cutting-edge technology at the interface of biology, medicine, chemistry, and engineering sciences • Interdisciplinary approach to researching and harnessing biological systems
Digital health	<ul style="list-style-type: none"> • Connecting healthcare, health, life, and society with digital medical and health technologies. • Information and communication technologies to support the treatment and care of patients
Pharma	<ul style="list-style-type: none"> • Research, development, and production of medicinal products for the cure, treatment, or prevention of diseases. • Combining natural sciences (e.g. chemistry, biology) with medical issues.

Source: NAI Apollo

Development of R&D expenditure vs. GDP and share of internal R&D expenditure in GDP



R&D spending in Germany is at the higher end compared to other countries. In 2021, according to preliminary information from Stifterverband Wissenschaftsstatistik, R&D expenditure in Germany totalled around €101 billion, which corresponds to around 3.1% of gross domestic product (GDP). In an international comparison, Germany is ranked fourth worldwide in terms of absolute R&D expenditure according to the latest available data. In a European context, it is also in fourth place regarding R&D spend as a proportion of GDP. The annual growth rates of R&D expenditure clearly exceed GDP growth in Germany, which underlines the stronger trends in the field of research and development. On average over the last 10 or 20 years, expenditure was between 3.8 and 3.3 percentage points above annual GDP growth. About two-thirds of spending stem from the business sector. There is a high level of investment activity in the areas of renewable energy, medical technology and information technology.

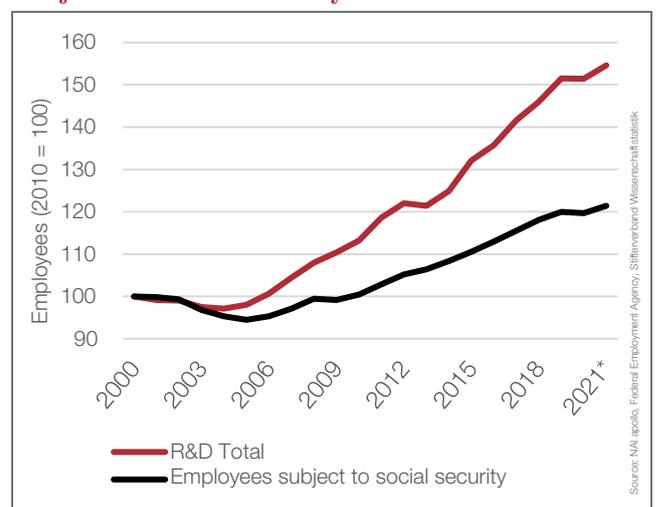
In addition, the federal government supports R&D activities in Germany through various funding programmes, such as the Central Innovation Programme for SMEs (ZIM) or the WIPANO program for funding patent applications. The European Union also supports R&D activities in Germany through the Horizon Europe programme for research and innovation, to provide one example. Overall, high R&D

expenditure in Germany boosts competitiveness and supports the innovative strength of the German economy.

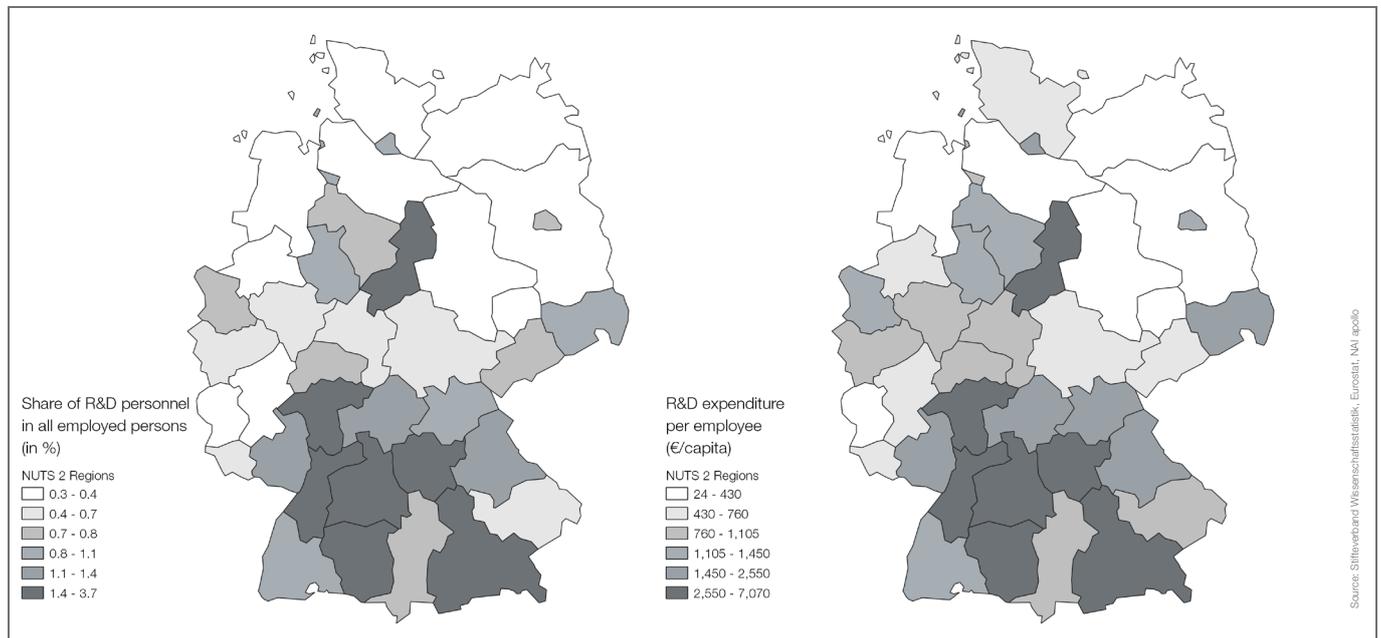
It also has a positive impact on employment and contributes to solving social challenges, such as climate protection, tackling pandemics and health care.

R&D employment figures have also grown sharply in recent years and in 2021 stood at an estimated 750,000 full-time equivalent employees. This corresponds to a 27 % increase in the past 10 years (employees subject to social insurance contributions

Development of R&D personnel vs. employees subject to social security contributions



Internal R&D expenditure (€/capita) and share of R&D personnel (in %)



grew by 15 %), which sets this sector well apart from the wider employment market. The business sector has been the main driver of employment growth in this field within the past 10 years (+30 %).

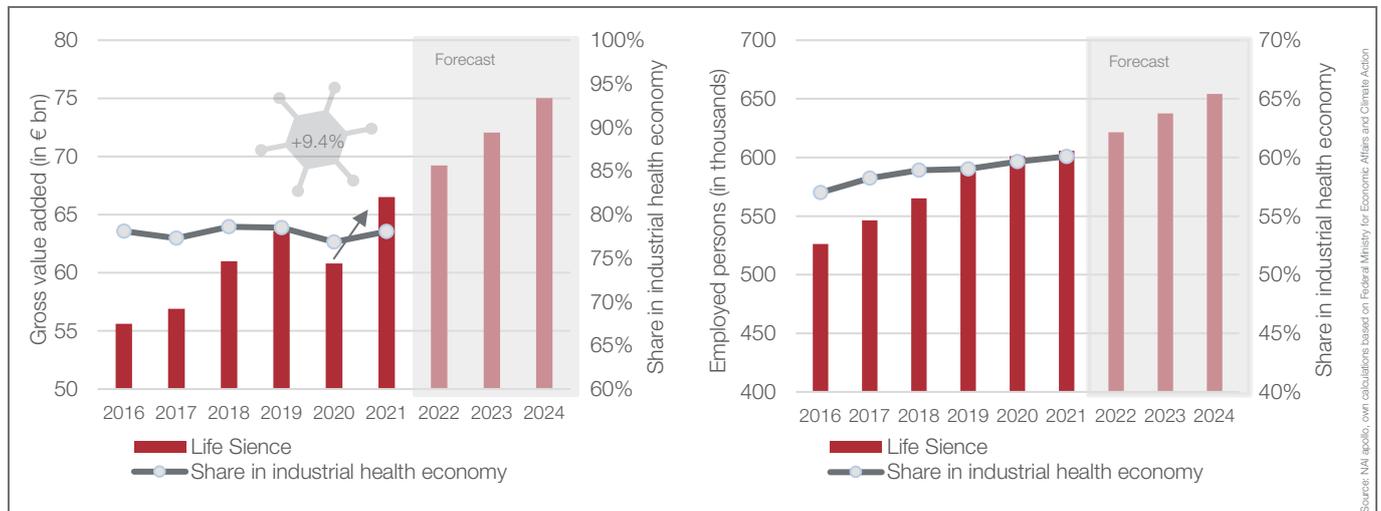
A closer look at the regional allocation of R&D expenditure reveals that the states of Baden-Württemberg, Bremen and Bavaria have the highest expenditure as a proportion of GDP. When broken down further using the NUTS 2 classification system for dividing up the economic territory of Germany, the regions of Braunschweig, Stuttgart, Darmstadt and Upper Bavaria stand out in terms of R&D expenditure and R&D personnel.

Industrial healthcare industry – a central area for life science

In order to illustrate the value of life science, it is worth focusing on the industrial healthcare industry. Parts of the industrial healthcare industry can be defined as a core area of the life science segment. This includes the production of human medicines, medical products and medical technology (including their trade and sale), research and development, digital health and biotechnology in the industrial healthcare industry. Neither state research institutions that are active in these areas nor institutions that are assigned to medical care (e.g. university hospitals with corresponding research departments) fall within this definition.

An analysis of the gross value added (GVA) reveals that the life science industry alone achieves a GVA of €66.5 billion (direct), which corresponds to a growth of around 20 % when comparing 2021 with 2016. In 2021, GVA increased by 9.4 % (after a decline in 2020). As a result, the average annual growth since 2018 is 4.1 %. If this trend continues, GVA would amount to around €75 billion by 2024.

Direct gross value added and employment in the Life Science sector (industrial health economy)



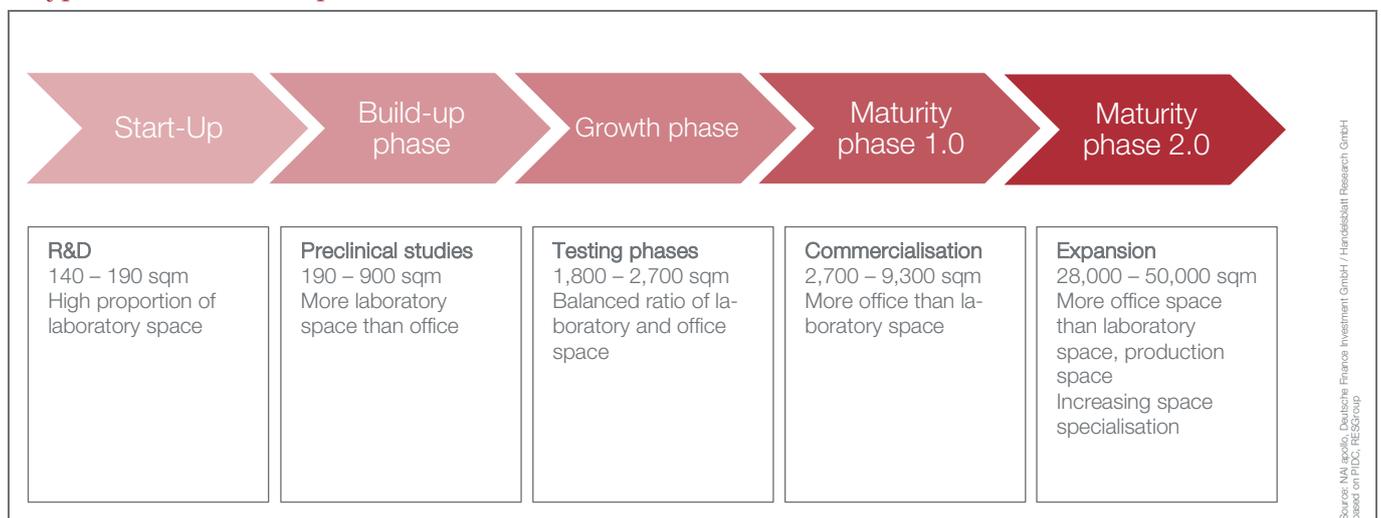
The number of people employed in life sciences within the industrial healthcare industry also grew strongly by 15 % in the period from 2016 to 2021. In certain sub-segments, employment increased by well over 20 %.

Currently, the largest proportion of employees are active in the fields of medical technology (32 %) and biotechnology (31 %). The number of employees has increased by 2.6 % on average per year since 2018, and a continuation of this trend would translate into more than 650,000 people employed in the life science sector by 2024.

Location requirements for life science property

The demand for space in the life science sector is highly individual and extremely complex owing to rising expenditure within the industry, strong employment growth and specific industry requirements. At this stage of the business cycle there is an increasing shift towards a requirement for more space. However, the need for laboratory and production space, which must meet certain equipment criteria depending on the research focus, is present throughout all phases.

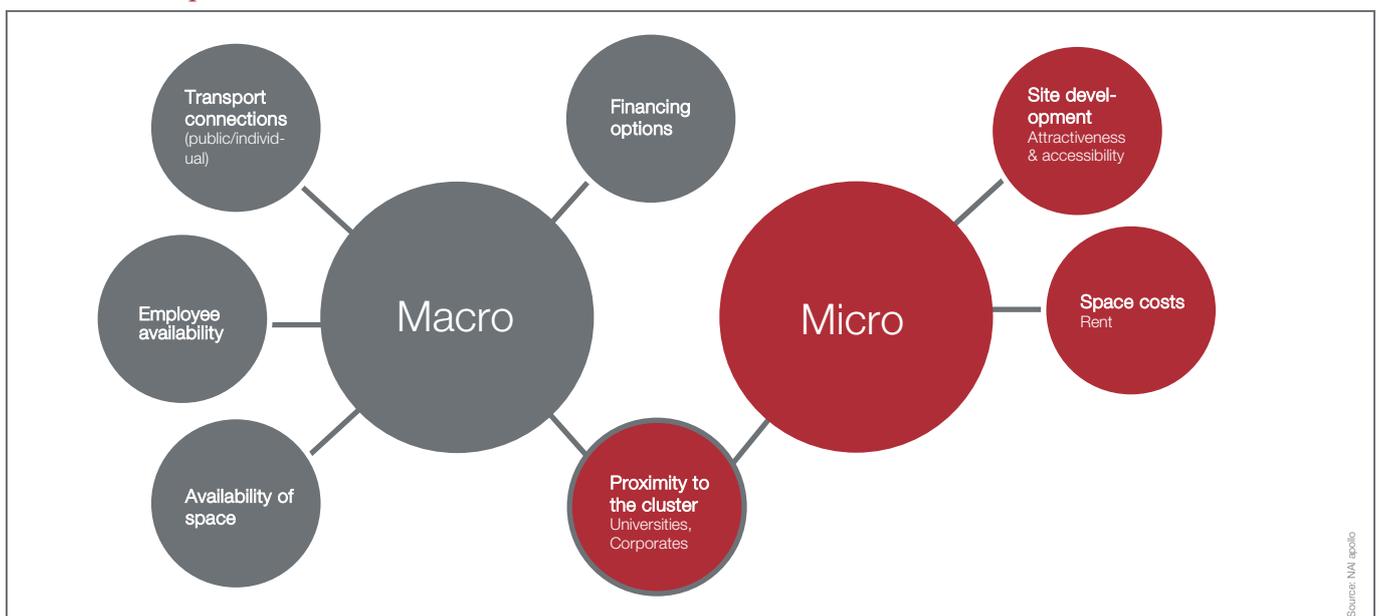
Typical demand for space in the Life Science sector



In addition to the specific building requirements, life science companies also have a preference for certain location factors within their micro and macro environments. In general, the R&D ecosystem (synergy effects through proximity to other institutions and companies) and the availability of specialists and young talents are considered to be particularly relevant:

- **Proximity to the cluster:** Locations close to academic institutions and research facilities provide access to talented researchers, academic resources and modern technology. These facilities can also serve as important partners for research and development projects and generally provide increased synergy effects at the site. In addition, a skilled network structure facilitates access to markets, customers, suppliers and distributors.
- **Availability of space / transport connections / site development:** The availability of space for the establishment or expansion of operations is a key requirement. A site with a good social, transport and technical infrastructure, including modern offices, laboratories, production facilities, logistics centres and transport options, is certainly an advantage for life science companies. The connection to public and private transport also plays an important role in terms of the attractiveness of a location, but also with regard to potential distribution options for products. In addition, soft location factors, such as the image of the location, can also be important for life science companies.
- **Space costs:** Costs, such as rental or purchase prices for the respective life science properties, are also an important aspect when choosing a location, but are often not considered by the respective companies to be the primary decision-making factor for the choice of location.

Location requirements in the Life Science sector



Source: NAI apollo

- **Employee availability:** Locations with a skilled workforce are advantageous for life science companies. A location that offers access to talented professionals ensures the sustainable development of the company through the employment of young talent. The proximity to universities and colleges once again plays an important role.
- **Financing options:** Life science companies often require significant financial resources for research, development and production. Locations with good access to financing options, such as venture capital and public funding programmes, can prove favourable for companies in the industry. Tax incentives, such as a low trade tax, also increase the economic viability of investments in research and development.

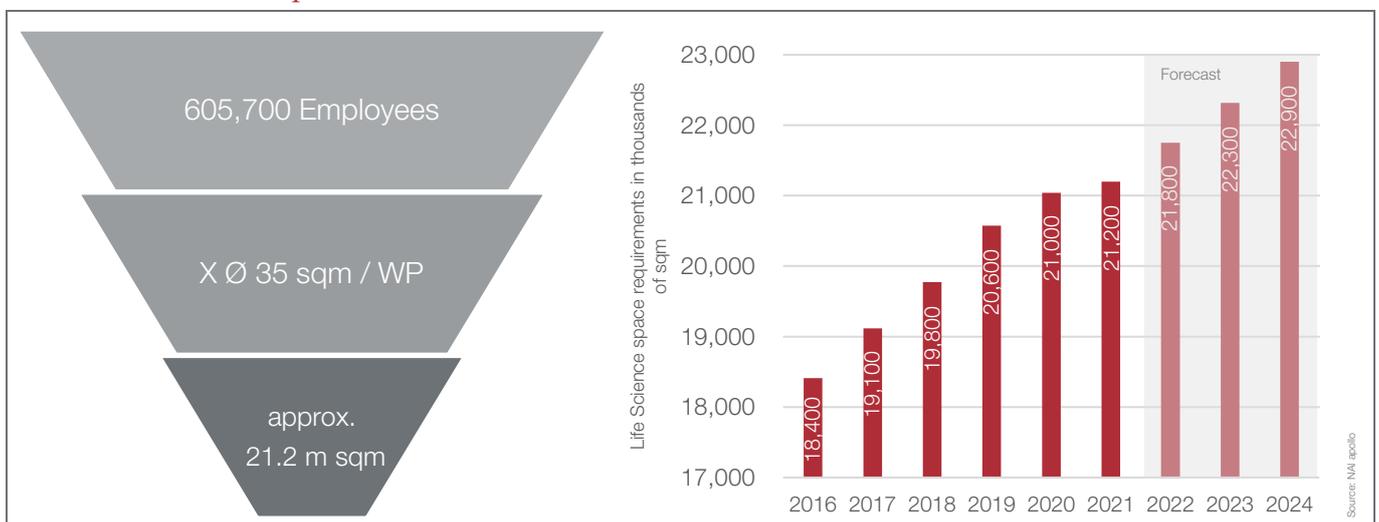
Life Science property market in Germany

Although awareness of the life science property segment is growing, there is still a lack of transparency in the market. This in turn makes it difficult to assess factors such as space take-up, rental levels and transaction volumes. The situation is further complicated by various overlaps with other asset classes that make a more precise separation more difficult. It therefore makes sense to use the parameters that are currently available in order to get as close as possible to the actual market situation.

Stock, space take-up, and rents – approximations

On the basis of requirement profiles, contract signings and projects, it is apparent that the use of space in life sciences is usually between 30 and 40 sqm per workplace (WP). Assuming that a WP uses an average of 35 sqm of life science space, the 605,700 employees in 2021 would occupy about 21.2 million sqm. In the period from 2020 to 2021, space theoretically occupied by the life science sector increased by 157,700 sqm. In comparison: actual space take-up in life science property amounted to about 70,000 sqm in the top seven locations during 2022.

Theoretical use of space for Life Science



The characteristics of life science property leases differ considerably from those in the classic office sector. Due among other things to the larger space requirements (per workplace) — primarily owing to a laboratory share that is usually above 30 % — leases in the life science sector cover a larger area than pure office rentals (LS: Ø 1,800 sqm / Office: Ø 850 sqm). There are also notable disparities between rental periods. On account of specific user requirements, life science projects are often designed for the long term, which results in longer contractual tenancies (≥10 years as a rule). Office leases (usually 5-10 years) usually have shorter contract terms in comparison. There is also a difference in terms of production costs for the respective property types, which is a consequence of the specific requirements of life science spaces (institute/laboratory building: Ø €4,100/sqm GFA/ high standard office: Ø €3,600/sqm GFA).

Market rents in the life science segment typically range between €12.00 and €20.00/sqm depending on the age of the building, the quality of the space, the location, the tenant and the rental period. In the case of new developments in Berlin, for example, rates of over €30.00/sqm are also achieved. Owing to the special cluster structure in life science, high rents for new buildings are not only limited to the classic top locations, but also extend to a number of locations that are already established in the life science market (Wiesbaden/Mainz, Mannheim/Heidelberg, Nuremberg). Here, rents in new developments can reach up to €28.00/sqm. Rents for upgraded (newly built) rental areas can be significantly higher than the values presented above depending on the exact work carried out by the landlord (e.g. security levels 1-4). Shell construction rents — whereby tenants then have to implement essential upgrades — are correspondingly lower.

With regard to the future need for space, using the extrapolation of employed persons (2.6 % p.a.) and the average workspace area mentioned previously, space requirements are estimated at almost 22.9 million sqm by 2024.

Typical structural equipment requirements for Life Science spaces

<ul style="list-style-type: none"> • Divisibility of space from 300 sqm per floor
<ul style="list-style-type: none"> • Ceiling load capacity of min. 1,000 kg / sqm
<ul style="list-style-type: none"> • Redundant building technology (heating, cooling, exhaust system, power supply, emergency power supply)
<ul style="list-style-type: none"> • Special media connections (gases, waste products, hazardous substances, etc.)
<ul style="list-style-type: none"> • Room height of min. 3.40 m, rather 3.60 m - 3.70 m
<ul style="list-style-type: none"> • Freight lifts / lifts with a load capacity of up to 2,300 kg as well as loading ramps for the logistical delivery and unloading of equipment and products.
<ul style="list-style-type: none"> • Vertical openings for increased ventilation
<ul style="list-style-type: none"> • Disposal options for hazardous substances

Further and more specific requirements result from the concrete use, the required safety level 1-4, or industry specifications and standards

Source: NAI Apollo

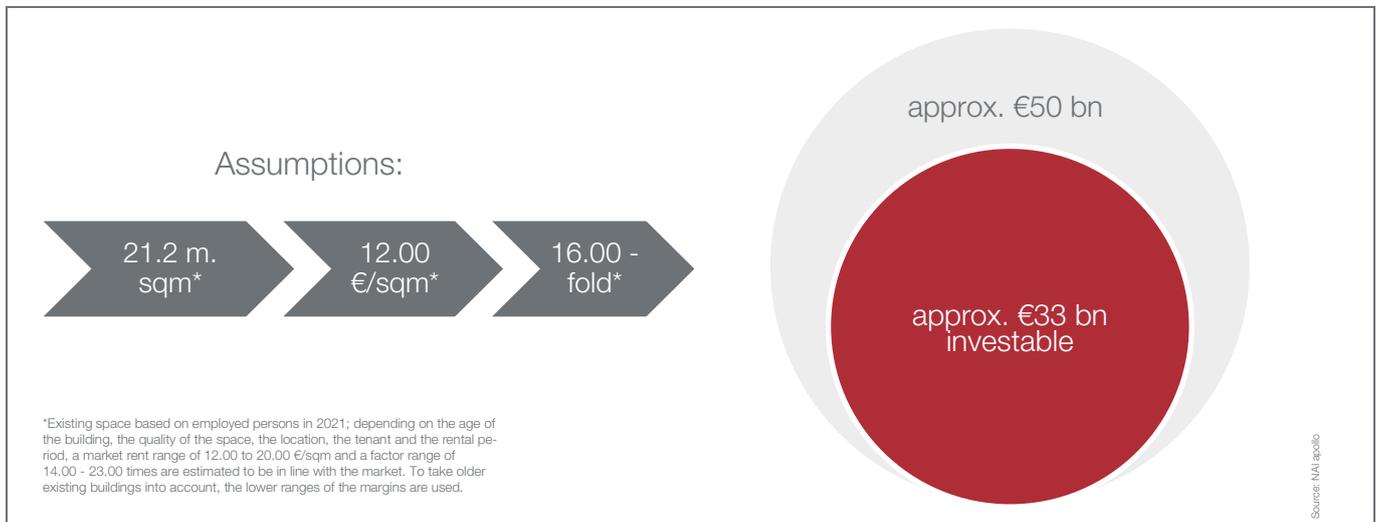
This means that around 1.15 million sqm of additional life science space will be needed in 2023 and 2024. Owing to the dynamic increase in demand for space and the low vacancy rate of only about 2 %, it can be assumed that there will also be a steady rise in excess demand for life science space in future, which will put pressure on rents in the segment.

Investment market

In the life science investment market, it is possible to acquire knowledge about the investment potential of the asset class on the basis of empirical values, assumptions and calculations. For this purpose, property stock based on the number of employees in 2021 (21.2 million sqm) was placed in relation to an average rental price and purchase price factor in order to illustrate a theoretical value of all life science property in Germany.

Purchase price factors for existing properties generally range from 14.00 to 23.00-times. In the case of

Theoretical value of all existing Life Science properties



project developments in top life science locations, multipliers above this range are also possible, but assessments here are heavily dependent on the current market environment and external factors.

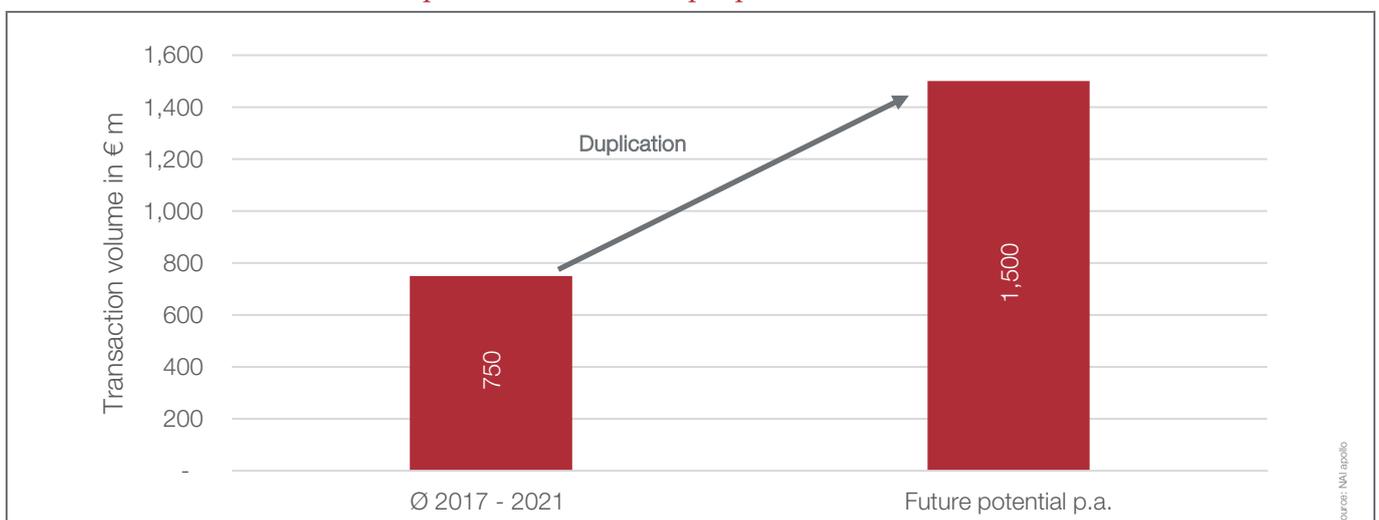
However, the calculation was not based on the peak values but on the bottom of rent and factor ranges in order to account for all aspects of the entire property stock such as location, quality, size, and others.

Based on these assumptions, the current value of all life science property in Germany is estimated at around €50 billion. Modelled on the office property market, around two thirds of this volume is

classified as suitable for investment, resulting in a value of up to €33 billion.

However, neither property stock that can actually be traded nor transaction activities in the life science sector cannot yet be equated with those in the office property market. Life science property typically has a significantly higher quota of owner-occupiers. In addition, a large number of buildings and life science parks are owned by the public sector, which rarely seeks to sell its property assets. As a consequence, investment activity has been very volatile in the past. Nevertheless, transaction activities and investment volumes have increased in

Forecast transaction volume p.a. of Life Science properties



recent years. Developer activity in this segment, which is already increasing and is set to continue in this vein, will also have a positive effect over the next few years, with additional products that are suitable for investment coming onto the market.

The dynamic development within the industry, coupled with expected positive trends based on the ongoing megatrends and companies that are willing to

expand, point to rising transaction volumes in the industry in future. On average, around 4.5 % of office assets that are suitable for investment have been traded on the office property market per year over the past 15 years. When applied to the current life science market, this would result in an average investment volume of about €1.5 billion per year in the future.

Conclusion and outlook

Life science in Germany is a dynamic growth sector. The importance of biotechnology, pharmaceuticals and medical research has increased in recent years and received an additional boost from the coronavirus pandemic. Life science has also been brought more into the public eye, with significant increases in gross value added and employment figures. While this applies to both the population and policymakers, it especially concerns investors who recognise the opportunities of this emerging market.

The life science property market is still nevertheless a niche product, although user demand is continually growing. In the metropolitan areas of Berlin, Hamburg, Munich, Düsseldorf/Cologne, the Rhine-Main area and Rhine-Neckar in particular, leading companies, academic institutions and research institutes have formed larger clusters where there is high demand for specialised property for the life science industry. Accordingly, there is also strong demand in these regions for potential new space, which will in all likelihood continue to grow in the coming years.

The property investment market has also become more significant. Although investment activities are very volatile, transactions in the corresponding assets have increased in recent years. The significant role of owner-occupiers and the public sector has inhibited development in the past, but institutional investors are increasingly interested in investment opportunities here, while supply is constantly rising due to a growing number of tradable new building projects. The life science property market in Germany offers promising investment opportunities for investors who want to make long-term investments in an emerging and growth-oriented market. International investors are a major driving force here, especially those from the United States where life science has established itself as a sought-after asset class and has already produced positive experiences.

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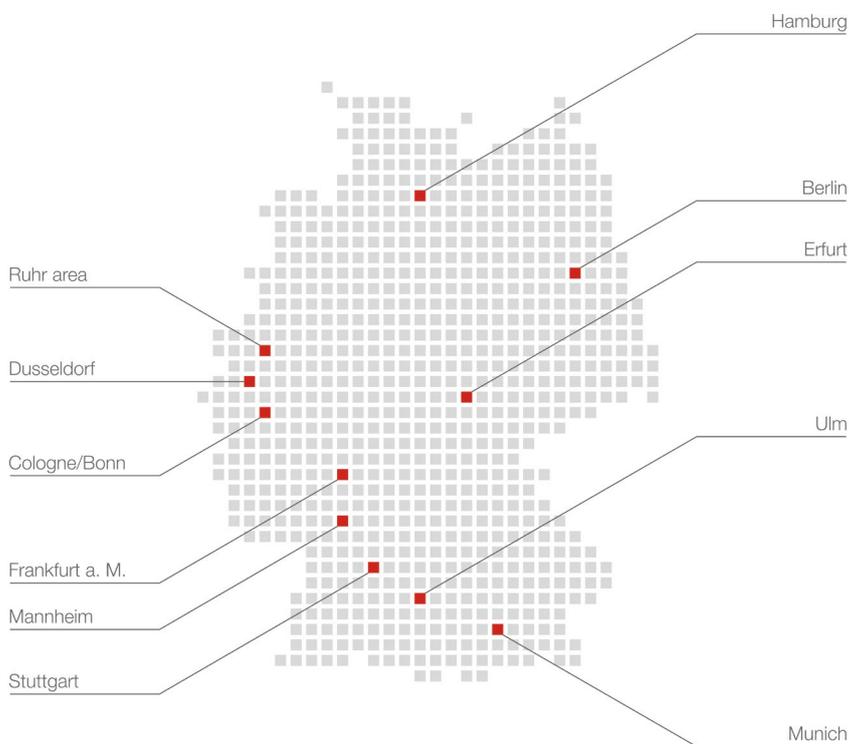
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