Article

Housing in Germany and the Rebirth of the High-Rise in Post-Modern Urban Design

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Abstract

High-rise buildings were a frequent design element in modernist urban planning and architecture. However, both the criticisms modernism faced and the negative experiences with large housing estates dating from that period led to post-modern designs that built strongly on traditional pre-modernist urban form. Despite the role of high-rise buildings in office areas, many brownfield and greenfield housing developments from the 1980s to the 2000s reflected this trend and abandoned high-rise buildings almost completely in Central Europe. Only recently, a renaissance of high-rise buildings as design elements for housing projects can be noted. The article traces this development by analyzing major design projects in Germany and offering explanations for this trend linked to major socio-cultural transformations and urban design innovations. It looks at the role of architects, urban designers, and other stakeholders in promoting hybrid urban design models and presents major strategies by cities under development pressure that try to manage their evolving skyline. Case studies deal with the five largest German cities of Berlin, Hamburg, Cologne, Munich, and Frankfurt am Main.

Keywords

Germany; hybrid urbanism; residential high-rise; urban design typology

1. Introduction and Methodology

European cities can hardly be described as "vertical cities," especially when considering residential neighborhoods. Important service metropolises such as London, Paris, or Frankfurt am Main have classic "cities" with a perceptible skyline, but there are far fewer high-rise buildings in less important cities. In residential quarters of European cities, high-rise buildings play a special role, especially in large housing estates designed according to the principles of the architectural-urban modernism of the 20th century. They are often part of larger social housing settlements, which, for a number of reasons, came under massive criticism towards the end of the 20th century (Graham, 2015). While social stigmatization is often overcome by redevelopment attempts with considerable social consequences, newer developments with neotraditional urban structures have spread in many places (Fishman, 2011; Helleman & Wassenberg,

2004). In the following, I call them "post-modern" (following the German notion *nachmodern* in Flecken, 2000) to denote that they can be seen as an echo of the critique of modernist urban design (Baldwin Hess et al., 2018; Grant, 2005; Hall, 2014; McCall & Mooney, 2018; Thompson-Fawcett, 2003; Zukin, 1988). Especially since the 1990s, a gradual renaissance of concepts consciously making use of residential high-rises has taken place in newly developing residential neighborhoods in a wider context of verticalization with the help of iconic architecture (Drozdz et al., 2018; Glauser, 2020; Greco, 2018; Harris, 2015). While particularly high-rise condominium housing has reshaped property and everyday life substantially (Lippert, 2019; Nethercote, 2022), it is worth mentioning that they have only gradually and selectively gained prominence in Europe. In contrast to "modern" urban quarters, high-rise residential and mixed-use neighborhoods often combine modern and traditional elements to form hybrid urban patterns.

It is noticeable that high-rise buildings as typological elements are to be used quite specifically for certain purposes, but their use is by no means primarily determined by conditions of profit-making. Rather, it presupposes diverse processes of social change since the middle of the 20th century and is based on a stable professional-political discourse conducted by architects and urban planners significantly co-determining urban design governance (see also Charney et al., 2021). It has become effective in the development of brownfield sites and increasingly for urban expansion projects again. Interestingly, in this context, the spatial distribution of high-rise buildings and their role in urban design seems under-researched (Drozdz et al., 2018; Eizenberg et al., 2019; Frenkel, 2007).

The article aims to explain how the changed role of residential high-rise buildings after the massive critique of modernist high-rise housing has been taken up by planning and urban design. After tracing the gradual spread of high-rise residential buildings in the second half of the 20th century in Germany and introducing ongoing debates, it explains how major German cities manage the current trend and try to sensibly integrate high-rise both in informal strategic planning and project development. The focus is, therefore, not on the potential impact of a gradual verticalization, often discussed internationally, but on strategies used for its implementation. The main arguments of the article are: (a) The "post-modern rebirth" of residential high-rise buildings is strongly dependent on project-based decisions and only hesitantly uses strategic planning to direct development, and (b) the implementation of high-rise housing requires an exploitation of opportunities that can be legitimized as most compatible in terms of urban design in their mostly "horizontal" urban environments.

The article builds on three research projects on recent urban design innovations and participation that have studied new housing developments in the 50 largest German cities since the financial crisis (Altrock, 2022a; Bertram & Altrock, 2021; vhw, 2018). The results were complemented by a survey of architectural and planning publications on the studied cities, council information and process representations of the cities, competition documents, and stated aims of designers and investors to identify the major urban design strategies that are currently applied when identifying sites and trying to regulate high-rise development.

2. High-Rise Residential Buildings in Germany: A Brief Overview of the Scholarly and Societal Debate

In contrast to the situation in Asia, for example (cf. Yuan & Yeh, 2011; representative of many similar works), high-rise construction in Germany has only recently been the subject of limited academic research (cf. Gibson, 1994). Interestingly, the literature on growth politics in German cities also rarely refers to the role of high-rise buildings (for Berlin, see Altrock, 2003; Colomb, 2013;

Lehrer, 2002; Strom & Mayer, 1998). This can probably be attributed to the specific economic development in Germany with a delayed financialization in the international context and an enormously increased pressure on inner-city real estate markets since the global financial crisis (Dörry & Handke, 2012; Schipper & Wiegand, 2015; Wijburg & Aalbers, 2017; see also Brake & Herfert, 2012). With regard to life in residential high-rise buildings, sociological studies played a significant role early on in the critique of modern housing developments (for an overview, see Herlyn, 1970; Zupan, 2021). It was only in the wake of Frankfurt's emergence in the 1990s of a skyline of high-rise office buildings, however, that interest in sociological, economic, and political science studies of high-rise housing in Germany resumed overall after the gradual demise in the 1970s as reflected in a comprehensive yet largely historic anthology (Rodenstein, 2000a). The critical assessments of high-rise residential buildings expressed in the early works are repeatedly taken up in architectural criticism (for example, Jonak, 2001/2018). However, they give way in the face of more detailed studies of residential satisfaction and renewed appreciation (Kabisch et al., 2022; van Damme et al., 2021; in the international context, see Althaus, 2018; Dorignon & Nethercote, 2021; Kalantari & Shepley, 2021; Lukas, 2007; Power, 1999; Turkington et al., 2004; van Kempen & Musterd, 1991; Wu & Ge, 2020) as well as a recent increase in the construction of high-rise residential buildings in German metropolises against the background of housing market shortages, enormously rising real estate prices, and increasingly spectacular individual projects, a tendentially rather open-minded echo among consumers, in the general press, and in real estate magazines (Baulinks, 2015; Hilgenstock, 2011; Jung, 2016; Kiefer, 2016; "Marktreport: Fast 80 neue Wohnhochhäuser in Deutschland bis 2018," 2016; Zabel, 2020). The main drivers and manifestations are being discussed, but, not infrequently, the focus is on planned projects without following up more closely which of them are realized.

3. Background: High-Rise Buildings in Germany After the Second World War

High-rise buildings were built in several cities starting in the 1920s for private corporate headquarters or public administrations (for the following, see especially Baumeister, 2021; Lange, 2008; Pappe, 2013; Schendel, 2021; Schendel et al., 2018; Weyer, 2020), taking up quite remotely the medieval idea of gender towers that protrude from wider buildings as very slender tower-shaped, less economical components. Only with a delay compared to the US, especially in the dynamically growing capital Berlin, did the first high-rise projects manifest design will and economic potency. The urban-architectural modernism that emerged in the interwar period produced a large number of projects by famous modern architects related to the Bauhaus school. They

remained largely visions but left a lasting mark on the debate about urban planning.

High-rise office buildings appeared only after the Second World War, but also the first high-rise residential buildings, built in green settlements, initially on inner-city sites, mainly in the course of reconstruction. The West Berlin international building exhibition Interbau (1957) can be considered of particular importance for the mainstreaming of this approach. "Post-war modernism" produced a whole series of high-rise buildings in many cities, but this development proceeded quite differently depending on the applicable legal traditions, the extent of destruction in the Second World War and the reconstruction concepts, and ultimately economic potency and housing demand. This can be readily seen in a quantitative compilation of high-rise construction activity (see Figures 1–5). Buildings over 50 m high were the absolute exception before the war, and there were no distinctive city skylines, with the exception of some office high-rises, built until 1975. Only Frankfurt and, to a certain extent, Hamburg were able to distinguish themselves as outstanding locations, while Berlin lacked the economic potency to do so. At that time, high-rise residential buildings were mainly erected in large housing estates, albeit rarely higher than 50 m. Their low numbers can be attributed to prominent locations with height accents. The major exception was Berlin, where considerable heights were achieved in both parts of the city in large housing estates, with an emphasis on standardized point high-rise types in East Berlin.

With the crisis of urban-architectural modernism, the turn to post-modernism, and the economic crises of the 1970s, the picture changed significantly: The construction of high-rise buildings declined dramatically, especially as the construction of large housing estates and social housing came to a close. Two exceptions are notable, however. First, the East German housing program did not really take off until the early 1970s, so a considerable number of high-rises were still being built there in suburban estates until German reunification in 1990. The brief unification-related office high-rise boom collapsed after a short time in an ongoing transformation crisis in Berlin. Second, towards the end of the 1990s, Frankfurt developed into a service metropolis, accompanied by a striking silhouette with buildings over 100 m high.

In the new millennium, a renaissance of high-rise construction is already evident in the quantitative overview, which is still continuing and assuming previously unknown proportions in terms of the height and locations of individual projects. This is represented above all by the numerous non-residential buildings between 50 and 99 m in height, while the smaller number of newly erected residential high-rises points to individual projects completely different from the large-scale residential construction of earlier times and will be examined in more detail below. Those trends are currently ongoing, but it is difficult to trace the number of projects (cf. Reicher & Söfker-Rieniets, 2021; Thiel, in press; Zabel, 2020).

4. Planning and Controlling High-Rise Development in German Metropolises in the 21st Century

The previous section indicated that the number of high-rise projects in Germany's largest cities has increased recently. This is due to a confluence of certain socio-cultural, economic, and political conditions. In recent decades, for example, extensive economic and
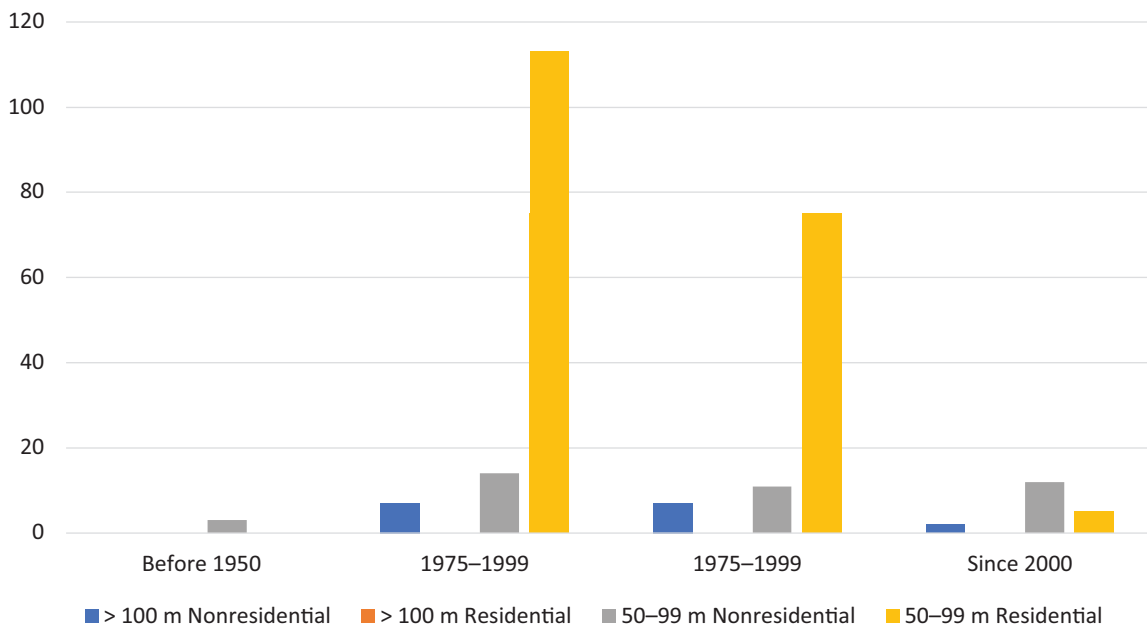

Figure 1. Construction of tall buildings (50 m and above) in Berlin. Sources: Author's work based on personal observations, Hilgenstock (2011), Wikipedia (2022a), and Zabel (2020).
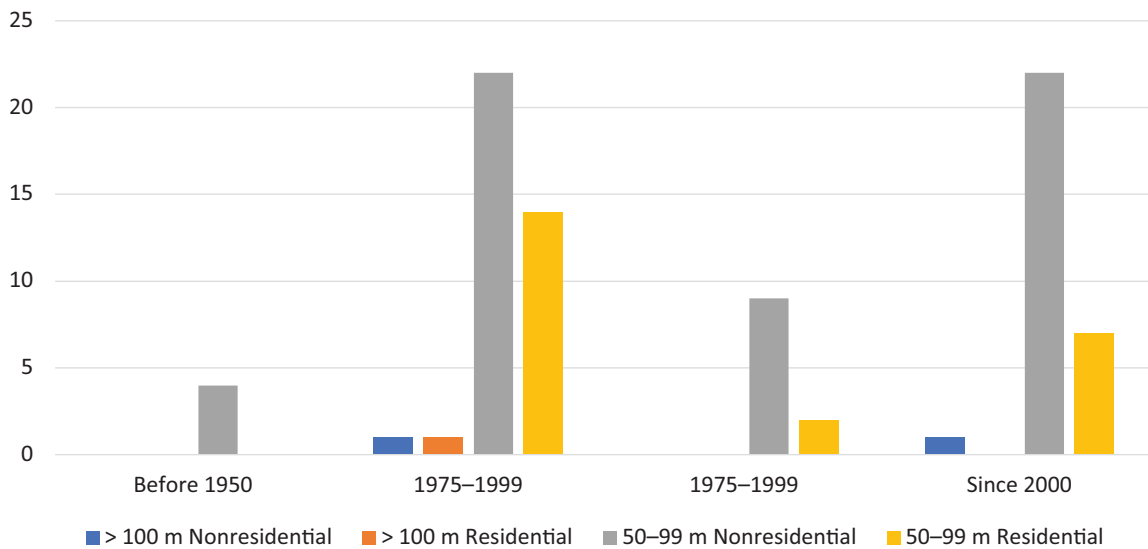
Figure 2. Construction of tall buildings (50 m and above) in Hamburg. Sources: Author's work based on personal observations, Hamburg (2022), Hilgenstock (2011), Wikipedia (2022b), and Zabel (2020).

infrastructural transformations have offered excellently located inner-city brownfield sites available for reuse. With an increase in the importance of metropolises and especially their inner cities, a large number of inner development projects for housing, tertiary uses (offices, hotels, retail), and culture were planned and realized. Both because of ongoing criticism of the landscape-oriented urbanism of the modern era and with the intention of limiting the use of "greenfield" sites for ecological reasons, higher urban densities have been accepted and translated into German planning law.

Site development dynamics and planning approaches of cities in dealing with the renewed demand for high-rise buildings differ significantly. Essential to this are path dependencies: firstly, the urban development pattern in post-war modernism resulting from the degree of war destruction and the type of reconstruction in relation to the partially preserved historic core with its traditional high-rise dominants; secondly, the local role of the service economy and the resulting demand for offices and hotels; and finally, housing policies of the cities with the respective role of social housing and large housing estates. The resulting approaches to development control, strictly regulated in formal land-use planning and requiring specific justification to allow for high-rise buildings at all, are roughly outlined in the following. They build on a literature review of the development until 2000 and an analysis of the newer plans and ongoing planning activities. The latter will look at how the cities consider architectural and urban design quality, determine locations and functions, and optimize decision-making (see also Table 1).
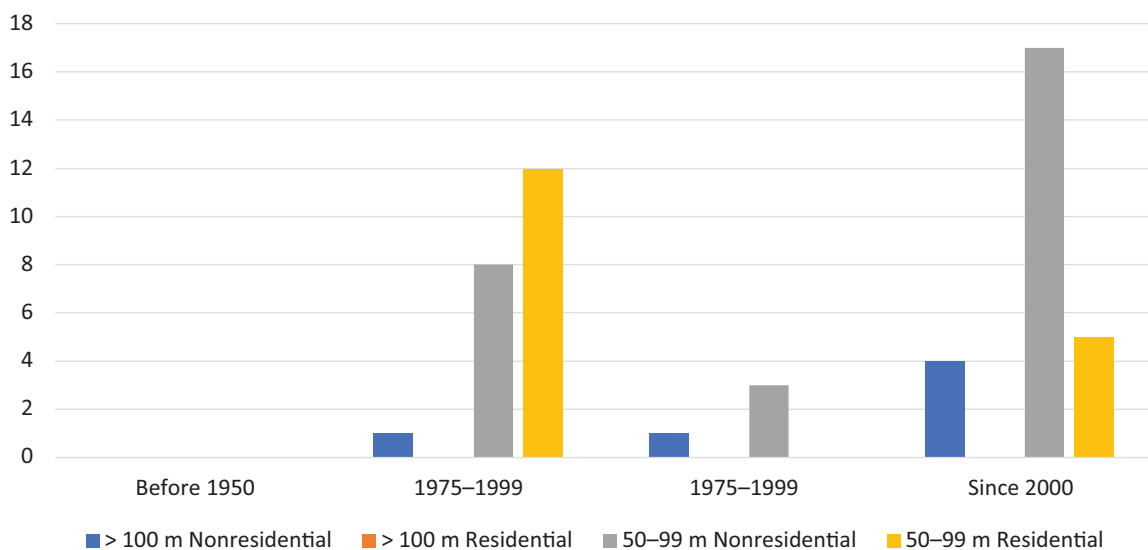

Figure 3. Construction of tall buildings (50 m and above) in Munich. Sources: Author's work based on personal observations, Hilgenstock (2011), Stadt München (2022), Wikipedia (2022c), and Zabel (2020).
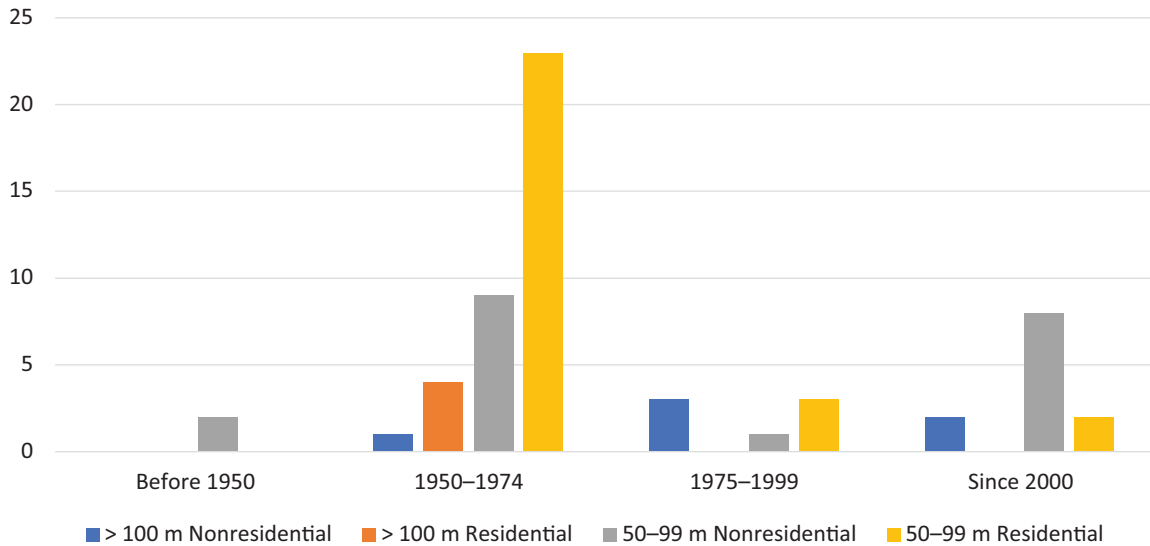
Figure 4. Construction of tall buildings (50 m and above) in Cologne. Sources: Author's work based on personal observations, Hilgenstock (2011), Wikipedia (2022d), and Zabel (2020).

Berlin must be considered a special case in light of its division in the second half of the 20th century (for the following, cf. Altrock, 2003; Flagner & Schick, 2017 for more background on Berlin's respective development). The dominant German metropolis before the war, it pioneered modern high-rise construction, but both parts of the divided city lacked the economic dynamism that would have continued this trend. Accordingly, a true high-rise city never emerged. In the capitalist West, a decentralized pattern of smaller high-rise agglomerations in central locations and of selective individual projects, mainly for public users, emerged, complemented in the periphery by high-rises in large housing estates. In the socialist East, large-scale residential construction dominated until the late 1980s, producing a large number of distinctive high-rises in both central and peripheral locations. After reunification, the pattern of central locations in the city reasserted itself against this background. A renewed focus on the former historic center by investors in the 1990s was accompanied by a commitment to the restoration of the traditional urban development pattern, dating back to baroque and historicism, so that a height development above the historic Berlin "eaves height" of 22 m was to be avoided. In addition to the reconstruction of this basic structure, severely challenged by war and division but considered to be identity-defining, the aim was to avoid a one-sided concentration of jobs in the tertiary sector in the inner city and thus an overload of the traffic infrastructure. Accordingly, planning considerations by the city government and local urban designers already developed before the reunification were continued (documented in Berlinische Galerie,
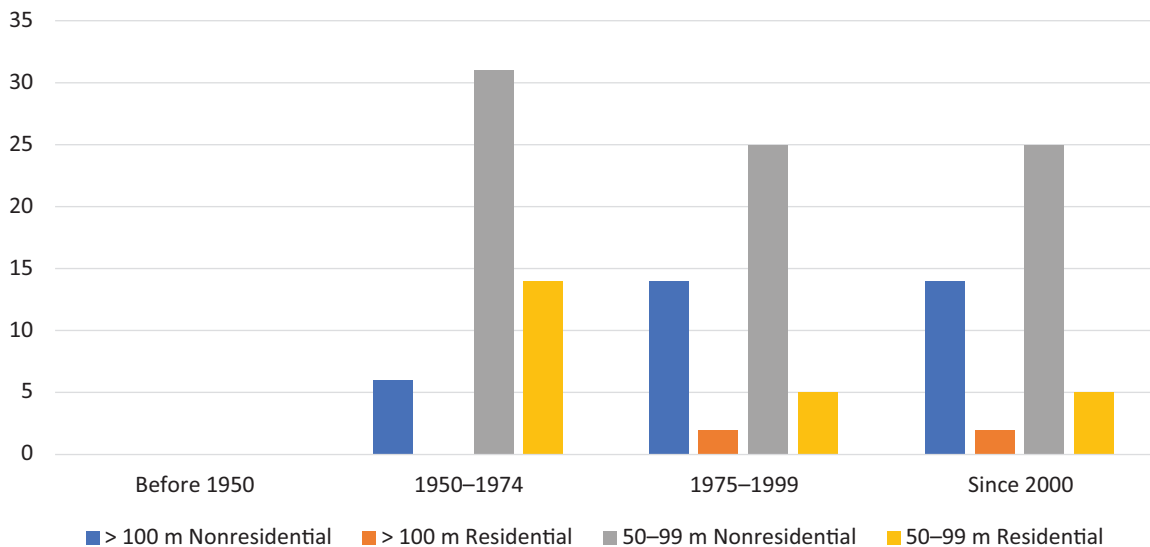

Figure 5. Construction of tall buildings (50 m and above) in Frankfurt. Sources: Author's work based on personal observations, Hilgenstock (2011), Wikipedia (2022e), and Zabel (2020).

1991; Lampugnani & Mönninger, 1991). They were based on permitting high-rise clusters almost exclusively foreseen for office development in three particularly suitable clusters (Breitscheidplatz, Potsdamer Platz, and Alexanderplatz) identified as sites for city development in the era of urban modernism, but otherwise directing high-rise development to well-connected relief locations on the inner S-Bahn ring (Senate Berlin, 1993). In all subsequent changes in urban development policy, this fundamental course has largely been maintained and safeguarded by planning law, complemented by informal urban design plans for the inner city (*Planwerk Innenstadt*; see Senate Berlin, 1999), individual competitions for key sites, and design committee (*Baukollegium*) recommendations. In the 2000s, less attractive residential towers in East Berlin's large housing estates were even demolished to reduce the vacancy rate in large East German housing estates. These sites later became the subject of new high-rise residential construction again when demand for housing surged in the 2010s. After demand for high-rise buildings took off then, a high-rise mission statement was conceived after a lengthy debate starting in 2017 and finally adopted in 2020 (Senate Berlin, 2020). For the first time, it formulates a set of informal planning principles that can serve as guidance for the legal justification of high-rise buildings. Such justification is required under German planning law when certain maximum density values are exceeded. The principles are also intended to strengthen living in the inner city. They call for a high-quality of site selection, architecture, urban design, open space and transport connection, sustainability, multifunctionality, and planning process. However, as it explicitly excludes strict criteria for site selection, it leaves future decisions open to project-related debates (see also the case studies that already reflect this approach).

In Hamburg, as in Berlin, the transformation of the inner city into a city dominated by high-rises failed to materialize despite considerable war damage, as the inner-city churches were still considered to be the dominant vertical accents (see Schubert, 2000). The multifunctional city center, largely determined by tertiary uses (administration, retail, hotels, culture), was thus rebuilt with only a few high-rise dominants. The demand for private corporate headquarters was directed early on (to relieve the inner city and mixed residential quarters) into the comparatively peripherally located City Nord, where its isolated height dominants did not affect the neighborhood. The quarter, later criticized for its monofunctional urban design, lived up to its purpose in that it accounted for almost 30,000 office jobs by the mid-1970s and, after an intermittent loss of importance, remains an important workplace location to this day. In addition, City Süd, located to the east of the city center, later became another relief location for the city center. Although the city focused on principles for its cityscape in the context of its strategic urban development plan, high-rise development was explicitly excluded there, on the understand-

ing that individual projects might be implemented outside the rebuilt historic core or at significant entrances to the city without affecting key vistas (FHH Hamburg, 1996, 2007, 2014). Besides, other selective high-rise projects and peripheral large housing estates with striking high-rise accents were built, but, as elsewhere, they came under criticism for their modernist urban design. Particularly with the conversion of abandoned port facilities directly south of the city center into the so-called Hafen-City, one of Europe's largest multifunctional urban developments for up to 45,000 office jobs and about 15,000 residents, which began in the 1990s, the city has now been trying for several decades to channel its growth dynamics close to the city center in a more mixed-use approach (Bruns-Berentelg et al., 2022; Flagner & Schick, 2017). Here, as on other inner-city conversion sites, competitions are being held to develop an effective small-scale urban configuration highlighted by iconic high-rise accents in selected locations. In contrast, there is intentionally no effective high-rise concept for the city as a whole.

Until a few years ago, high-rises played a minor role in Munich. Although the city has experienced an enormous and ongoing economic upswing since the Second World War, this was based only to a lesser extent on outstanding companies in the service sector. As a result, striking high-rises were only erected at isolated locations as corporate headquarters (Hoffmann, 2000). The large housing estates that were also built on the outskirts played a role in the cityscape, especially in connection with the preparations for the 1972 Summer Olympics but remained limited to a few selected locations. For vertical urban development, the orientation towards historic high points was central until recently, following two high-rise studies commissioned by the city in 1977 and 1995 that gave priority to the protection of the historic cityscape over being superimposed by high-rise buildings and defined a large part of the city as a protection zone for this purpose. Besides, the 1995 study identified areas suitable for further densification, but proposed no instruments for control that went beyond the usual planning law (Stadt München, 2022; Schreiber, 1977, 1995). Thus, high-rises were not to exceed the height of the city's landmark, the twin towers of the Frauenkirche. To reinforce this, a referendum was brought about in 2004, strengthening the local consensus laid down informally thereafter in a series of debates among experts and politicians (Baumeister, 2005). Only in the last few years, extensive inner-city brownfield development next to railroad facilities and the formulation of a northeastern city entrance along an important development axis have defined stronger high-rise accents largely on a project basis.

After destruction in the Second World War and modern reconstruction, the city of Cologne had already become the scene of a deliberate framing of the old town, characterized by its medieval church towers and high-rises with various functions along the historic

ramparts and along outward roads (Precht von Taboritzki, 2000). Although these high-rises are unmistakably "modernist" due to their striking architectural form and their inadequate urban integration into their vicinity, they have given the city an unmistakable skyline. Beyond them, high-rise residential buildings have been built primarily in peripheral large-scale modernist housing estates. In the 1990s, in response to criticism of individual high-rise projects, considerations were given to a high-rise concept, which was drawn up by the city planning office and discussed in several stages up to 2,000 in several variants. The aim was to keep the visual links to the cathedral free and to ensure good traffic connections for high-rise buildings so that intersections between radial and ring roads and areas on the eastern waterfront were discussed. The plan was never adopted, though. In recent years, the development dynamic that has spread to brownfields and former commercial areas has brought about individual high-rises near the banks of the Rhine, but further-reaching plans in this regard have come into conflict with the 1996 entry of Cologne Cathedral on the UNESCO World Heritage List because of the competition with the historic silhouette (Flagner & Schick, 2017; Michel, 2005). Efforts to systematize infill development around the inner city, still characterized by the very open urban landscape of post-war reconstruction, have identified a variety of potentials for further redensification, which are to be developed more in line with traditional urban planning models and high-rises as individual accents (Unternehmer für die Region Köln & AS+P, 2008), and no specific high-rise plan has been adopted so far.

Like no other city in Germany, Frankfurt am Main has developed into an outstanding financial metropolis with a distinctive silhouette only gradually after the Second World War. The city government, focusing on the tradition of the city as a commercial center, favorably gave permissions for moderate high-rises from the 1950s onwards, proposing sites around the old town in the first high-rise plan published in 1953 (Müller-Raemisch, 1996; Rodenstein, 2000b). When the city gradually became the German banking capital, additional high-rise buildings were to be concentrated in the historic Westend villa district, roughly west of the old town, in the 1960s, which led to fierce resistance in the local population. Besides, it developed a relief location between the city center and the airport in the Niederrad district. Because of the considerable impact on urban development, the city set up a number of plans that attempted to channel high-rise office buildings along main outward roads (*Fingerplan*, 1968) and in cluster form in an area west of the historic old town that became the nucleus of the subsequent skyline (*Bankenplan*, 1970). When the demand for office space increased further, additional high-rise buildings were to be concentrated along the outward road of Mainzer Landstraße (*City Leitplan*, 1983; see Speer & Praeckel, 1984). With the settlement of the European Central Bank in 1999, the new demand was to be channeled with the help of another plan, consolidating and complementing the skyline that had developed (*Hochhausentwicklungsplan*, 2000, see Jourdan & Müller PAS, 1998; Stadt Frankfurt, 2008). It was the first plan that foresaw residential uses in the high-rises. Not only was the height limit increased further, but by making use of extensive former railroad areas, the area for high-rises expanded considerably thereafter. Development is now to be controlled by means of the amended high-rise master plan from 2000–2008—not always successfully, though (Flagner & Schick, 2017). Recently, however, the market situation has changed considerably: Vacancies of office space contrasted with a very tight residential market, so that both conversions from office to residential high-rises and the construction of extremely high-priced residential high-rises can be observed. The city is currently still working on yet another Hochhausentwicklungsplan 2021, a commission awarded to a team of three consultants proposing stronger mixed-use but obviously trying to avoid future residential high-rises as the existing ones have high vacancy rates (Baier, 2022; Skyline Atlas, 2022; Stadt Frankfurt, 2022).

While strategic development plans integrating the idea of "building culture" have increasingly addressed issues of the cityscape and thereby occasionally produced localized guidelines for high-rise buildings (Hackenberg et al., 2010), the overview makes clear that the cities intentionally pursue completely different approaches: While Frankfurt has long tried to regulate high-rise development in master plans, Hamburg and Munich followed simple general principles but have nevertheless seen a number of controversial project-related decisions that have ultimately led them to make commitments to their long-standing principles. Cologne has often aimed at regulating development more clearly, but never really succeeded in setting up a consistent strategy. Berlin, referring to the difficulties of other cities implementing strict principles, relies on an all-encompassing set of quality criteria but formulates them only as a very soft orientation. The most stunning observation concerns the ways the cities deal with site selection: While all the cities pursue common general principles, only Frankfurt regularly identifies preferential locations—a strategy Berlin and Munich also pursued for a time. The increasing demand for residential high-rises has not led to serious efforts in setting up principles for them anywhere.

5. Residential High-Rises: A Post-Modern Rebirth?

When turning to high-rise residential buildings now, it is important to reflect professional discourses by architects and urban planners over longer periods of time. They have aimed at a "reconciliation" between modern and post-modern urban design principles at several levels (Altrock, in press; Schenk, 2017; Schipper & Wiegand, 2015). Essential qualities of modernism are

Table 1. Approaches to informal planning for high-rises in five German cities.

| Features | Informal plans | | Project-related principles and requirements | | | | Role of residential high-rises |
	Tradition after the Second World War	Current state	Site selection	Integration	Architecture	Decision-making	
Berlin	First orientational plans in 1980s	Plan adopted in 2020	Key locations	Transport nodes, quality of open space	General call for quality, energy-saving	Competitions, design committee	Not explicitly covered
Hamburg	No plan	No plan	(Key locations along the waterfront)	(Transport nodes)	(Preference for star architecture)	(Competitions)	(Not explicitly covered)
Munich	Series of high-rise studies	Referendum 2004	Preference for ring roads and peripheral key areas	Preference for transport nodes, (quality of open space)	Height restriction, (general call for quality)		Not explicitly covered
Cologne	Several orientational plans, not adopted	No plan	(Preference for ring and outward roads and waterfront)	(Preference for transport nodes)			(Not explicitly covered)
Frankfurt	Long series of plans	In preparation	Central clusters and key locations mix	Consolidation of clusters, functional	Extreme heights to develop skyline, energy saving	Competitions	Selected locations recommended discussed skeptically

Note: All cities have traditionally built on the principle of protecting the historic cityscape and have a considerable stock of residential high-rises in large housing estates, which is not mentioned in the table; principles that can be loosely identified where no plan is adopted are in parentheses.

seen in potentially high residential densities despite the availability of green spaces, especially when making use of new technological possibilities allowing for larger window openings and, thereby, ultimately greater building depths. Attempts to rehabilitate high-rise residential buildings are based on the now widely shared assessment that the negative stigmatization of modern large housing estates is not primarily attributable to the inhumane scale of high-rise residential buildings. Rather, it is seen as the result of a one-sided social housing-related occupancy policy. With changing household structures and urban lifestyles, a renewed demand for well-designed and equipped residential high-rises is postulated (and evidenced in some of the individual projects presented below). Additionally, far-reaching attempts to rehabilitate brutalist architecture have recently found favor in the architectural debate, which has contributed to reevaluating modernist large housing estates (Elser

et al., 2017; Harnack, 2014). Their renewed recognition is coupled with more far-reaching approaches for a careful treatment of testimonies of brutalism, such as careful urban regeneration, a stronger orientation towards preserving the gray energy stored in existing buildings, and probably ultimately also a post-modern trend towards stylizing brutalist buildings as vintage fashion.

Together, the above-mentioned debates have led to a situation in which high-rise residential buildings can once again be counted as part of the legitimate repertoire of urban design, and not only in the context of luxury projects on unleashed real estate markets such as in the center of Frankfurt or Berlin, where they had come under massive criticism in the late 20th century. So far, there are indications that they are now also being used again in large housing estates planned on the outskirts of swarm cities, where central areas are highlighted with height accents visible from afar, and a variety of

housing options is propagated, seeking to take advantage of opportunities for living on the edge with excellent views into the countryside.

Against the background of weak master planning, it is interesting to analyze the key features of individual projects that are realized. As a number of projects is currently under discussion in the cities with uncertain outcomes, the following section will limit itself to a tentative typology of approaches that may have to be revised in the future. It is based on a set of observations and interpretations drawn from the projects compiled for Section 3 (see references there), but it has not been possible to present a complete list here. For the compilation, city government websites and architectural yearbooks (Hamburgische Architektenkammer, 1989–2022) were additionally scanned.

Due to length restrictions, this section will have to set a strong focus on how sites are selected and the role urban design principles play in this respect. For this purpose, the appearances of high-rise buildings in the context of housing are categorized according to their spatial context. The first two concern entire neighborhoods, while the latter looks at a variety of approaches towards realizing individual or small groups of residential high-rises: (a) new neighborhoods on redevelopment sites, (b) further development of city clusters, and (c) "reuses" of buildings and sites.

5.1. New Neighborhoods on Redevelopment Sites: "Hybrid" Ensemble Urbanism in the Making

With a gradual shift towards "reurbanization" (Brake & Herfert, 2012) in the 1990s, the question of appropriate urban development concepts for inner city areas was frequently raised. Higher densities than in the modern era almost universally prevailed, which were considered plausible by the cities for the reuse of brownfields: There were hardly any serious conflicts with neighbors to worry about, as compared to denser development on the urban fringe adjacent to single-family neighborhoods. As land for reuse is costly, private investors were allowed higher densities to make development profitable in the first place. Motivated by criticism of modernist urbanism, inner-city locations, in particular, should allow for greater urban diversity through denser neighborhoods. More "urban" neighborhoods were popular with a demand by younger singles and couples.

In brownfield redevelopment, however, it was not only a higher density that prevailed. In addition, individual height accents were often combined with perimeter block concepts to create an address and to give the respective neighborhood a certain distinctiveness. Particularly in competition procedures, urban planning models that propagated a combination of uniform height development and emphasis on a literally outstanding individual building as an eye-catcher were repeatedly met with approval by architects and urban planners, members of juries themselves trained in urban design,

and private developers interested in presentable marketing features.

This philosophy of a combination is applied in functionally mixed sites also in order to generate greater urban diversity (see Figures 6a and 6b in the Supplementary File). Larger inner-city residential neighborhoods—typically in attractive waterfront locations—are classically "crowned" by a single high-rise office or hotel building. The redevelopment of Frankfurt's Westhafen port from the 1990s onward probably represents the first well-known example here (Wentz, 2022), followed by projects such as Dahlmannkai, well-known internationally as the first phase of HafenCity in Hamburg, and Main Plaza on Deutschherrnufer in Frankfurt (2001).

Interestingly, similar cases can be found in which the marketability of high-rise residential buildings is cautiously explored for the first time when they are not built within the framework of social housing. From today's perspective, however, these are still far from the luxury of projects that are currently being planned in many places (see Figures 7a and 7b in the Supplementary File). Starting in the late 1990s, Theresienhöhe residential quarter was developed on the abandoned inner-city trade fair grounds in Munich according to a design by Otto Steidle (Haberlik, 2004). Its striking Park Plaza building uses balconies sculpturally for the facade design. Starting in 2000, the much smaller Falkenried Quarter was built on the site of an abandoned tram depot in Hamburg (Meyhöfer, 2005). It combines a number of different structures for various types of housing. The special eye-catcher is a studio residential tower by Bolles and Wilson, emphasizing an urban articulation point. Similar approaches are being pursued in other cities.

5.2. Further Development of City Clusters: Attempts at Functional Enrichment

Traditionally, in service metropolises, in addition to the city proper, new subcenters are often developed, which, because of their less central location, must be made attractive at great expense. This includes, among other things, the symbolic charging with urban development highlights, which also include elaborately staged high-rise clusters. In Europe, London Docklands and La Défense in Paris are probably the most important examples of those strategies and their challenges.

In view of the recent dramatic rise in real estate prices, new secondary centers with complex office, hotel, retail, and residential uses are also being realized in outstanding locations (see Figures 8a–8e in the Supplementary File). They have been occasionally planned on conversion sites like the projects discussed above, but due to their favorable location near high-ranking transportation hubs or existing central business districts, a set of high-rise buildings is accentuating the site. Attempts to create more functionally mixed areas and the current demand for high-rise luxury living have now made them into favorable locations for residential high-rises.

A first example is the Bavaria Quarter in Hamburg, completed in 2008 following a 2002 competition by various internationally renowned architects. There, a deliberate framing of the redevelopment site with several high-rise buildings of different uses reflects the idea of shaping outstanding inner-city sites that allow for architectural diversity in increasing competition among cities (Rauterberg, 2008).

An urban planning competition held in the early 1990s for the area of urban devastation near the Berlin Wall had concluded that accents with a maximum height of 60 m should only be possible at prominent points on the banks of the Spree River, but that the area should otherwise be rebuilt in line with the usual eaves' height in Berlin (Altrock, 2003). Construction activity only got off the ground in very few places after the end of a serious local economic crisis. Throughout a series of planning exercises for smaller sub-areas, designers were able to successfully place arguments for the need for further urban accents (Bezirksamt Friedrichshain-Kreuzberg von Berlin, 2004). Concepts for subareas reflect the individual considerations for height accents that were discussed at different points in time. In that context, an urban design concept by Hemprich and Tophof architects for the redevelopment of a former railyard foresaw the framing of a newly built area of perimeter blocks around a convention center by high-rise buildings that are currently being realized. The twin residential towers called "Upside Berlin" by the local architect Tobias Noefer clearly reflect the trend towards luxification. Despite their difficult location in a densely packed office cluster, the site is justified as a contribution to enriching the functional mix in the area.

In Frankfurt, the Skyline-Plaza, implemented after complicated negotiations with city politicians as the eastern prelude to Europaviertel, an extensive urban redevelopment area on former railroad tracks, now complements Frankfurt's central business district (Altrock, in press). The complex includes the (180 m high) Grand Tower, completed in 2020 according to the 2014 competition-winning design by Magnus Kaminiarz & Cie, and the Grand Central, two of the tallest high-rise residential buildings in Germany.

The idea of functionally complementing city clusters with residential uses has occasionally also produced mixed-use high-rise buildings (Merkel, 2018; Thiel & Mach, 2020). Several floors of hotels or office high-rises are reserved for luxury apartments, thus meeting a high-priced residential demand or combined with office and hotel floors. So far, mixed-use high-rises have been found mainly in Frankfurt as spectacular designs (e.g., Omniturm/Bjarke Ingels, One Forty West/Cyrus Moser).

5.3. Reuses of Buildings and Sites: Rare Opportunities to Cater for a Variety of Housing Demands

When it comes to planning individual residential towers, it is difficult to find appropriate sites in low-rise inner cities and to justify height accents. Therefore, the reuse or transformation of existing buildings can act as a welcome opportunity to realize luxury housing to diversify the functional structure of less significant monofunctional service centers with decreasing demand for office space (see Figures 9a, 9b, and 9c in the Supplementary File). Frankfurt-Niederrad, now marketed as "Lyoner Quartier," serves as an example. As a first step, the vacant Lyoner Straße 19-office tower was converted into luxury apartments with three additional floors in 2010 by architect Stefan Forster, to be followed by additional projects. As rents in the office market are usually much higher than in the residential market, such a strategy is only realistic if it targets the top end of the market. Not far away, the Henninger Turm in the south of Frankfurt, once built as a landmark brewery tower, was to be demolished, but its strong iconic architecture was ultimately used to develop a project for luxury apartments strongly resembling it, designed by Meixner Schlüter Wendt and completed in 2017, in a low-rise neighborhood where a new tower would hardly have found political support.

In East Germany, where large-scale demolitions were carried out to stabilize the housing market in times of shrinking populations in East German cities with help of the Stadtumbau Ost (Urban Redevelopment East) funding scheme, this involved particularly point high-rises and 11 to 16-story row buildings that were no longer marketable. At least in recovering cities with tight housing markets like Berlin and Leipzig, both individual projects with striking point high-rise buildings and smaller clusters with the particularly deep buildings mentioned above are now being built on demolition sites (Howoge, 2022; see Figure 10 in the Supplementary File). Sites can be justified as the original buildings had also been high-rises (Altrock, 2022b).

The preceding examples show that, especially where high-rises have already been developed in the surrounding area before, new additions can be justified in the planning process if they have tied in with their environment in terms of urban development. In the context of incrementally redeveloped brownfield sites, this is of crucial importance. By placing stand-alone residential high-rises in certain locations, it has been possible to address a luxury segment in the market within the framework of the dynamic land price developments observed in recent years, for which hardly any offers had previously been made. This is how, for example, the Living Levels on the Spree near Berlin's Ostbahnhof, designed by nps Tchoban Voss and completed in 2015, came into being (see Figure 11 in the Supplementary File). It uses a spectacular architectural design and an outstanding location in the city with panoramic views as distinctive features for marketing purposes, in addition to luxurious amenities.

6. Discussion and Conclusions

The analysis shows that the debate about high-rise buildings as design instruments, on the one hand, and

possibilities for self-expression and maximization of land utilization, on the other hand, never completely disappeared, even in Germany, which was skeptical about high-rise buildings and rather characterized by horizontally organized cities. After the earlier sharp turnaround in urban design with the demise of large-scale housing, social transformations with changing lifestyles, household structures, and a positive reassessment of "urban" living created the conditions for rehabilitation of high-rise living. However, this could only succeed much later through a conscious departure from the building type as part of social housing and with the development of affluent user strata. However, the foundation for this was by no means laid primarily by developers. Rather, it was dependent on a variety of preconditions. These included, first of all, the departure from the legally established low-density ceilings of the modernist era, which prepared the ground for a new "urbanity." Secondly, it was the architects who persistently explored new possibilities for setting urban accents, believing in the urban qualities of high-rise buildings in the sense of modernism beyond social housing. Furthermore, technological changes contributed to the fact that the luxurious impression of high-rise apartments could be realized at all. The formation of the residential high-rise as a brand with special possibilities for distinction, which addressed a globalized clientele, was ultimately only able to assert itself with the economic transformation after the global financial crisis. And finally, the unleashed real estate market and the housing shortage in the large metropolises were decisive factors. The boom that can currently be observed is reflected in numerous spectacular individual inner-city projects but also in many varieties of "hybrid" urban development on redevelopment sites and even on the outskirts of cities, which aims to combine the urban development qualities of modernism and post-modernism in a targeted manner. Crucially, the definition of the sites takes place at three spatial levels. Attempts to regulate high-rise development in informal city-wide plans are met with skepticism or obstacles with the exception of Frankfurt and, therefore, only provide some general orientation. The main urban design efforts are made at the neighborhood level, where "hybrid" forms are to merge qualities of the high-rise building and the perimeter block, and office clusters are to be functionally enriched even by residential high-rises. At the level of an individual plot, various opportunities are taken up to reuse or reinterpret former sites of high-rise buildings for residential high-rises. In this sense, Germany is still a long way from the high-rise developments of other countries and will probably be able to use high-rise buildings in a targeted manner in terms of design. However, incremental and poorly controlled developments show that this does not guarantee coherent urban development of larger neighborhoods in the long run.

Supplementary Material

Supplementary material for this article is available online in the format provided by the author (unedited).

References

Althaus, E. (2018). *Sozialraum Hochhaus: Nachbarschaft und Wohnalltag in Schweizer Großwohnbauten* [Social space high-rise: Neighborhoods and everyday life in Swiss large apartment buildings]. transcript.

Altrock, U. (2003). *Büroflächen in Berlin* [Office space in Berlin]. Reimer.

Altrock, U. (2022a). New (sub)urbanism? How German cities try to create "urban" neighborhoods in their outskirts as a contribution to solving their recent housing crises. *Urban Governance*. Advance online publication. https://doi.org/10.1016/j.ugj.2022.04.001

Altrock, U. (2022b). Baukultur in Großsiedlungen [Building culture in large housing estates]. In U. Altrock, R. Kunze, D. Kurth, H. Schmidt, & G. Schmitt (Eds.), *Baukultur in der Stadterneuerung* [Building culture and urban regeneration] (pp. 265–302). Springer.

Altrock, U. (in press). City-Bildung und Stadtumbau auf ehemaligen Bahnflächen [City-building and urban redevelopment on former railroad sites]. In In U. Altrock, R. Kunze, D. Kurth, H. Schmidt, & G. Schmitt (Eds.), *Stadterneuerung und Spekulation* [Urban regeneration and speculation]. Springer.

Baier, U. (2022). *„Die Stadtplanung hat die Aufgabe, Lebensrealitäten zu entwickeln": Interview mit Mike Josef* ["Urban planning has the task of developing living realities": Interview with Mike Josef]. Stadt Frankfurt am Main. https://frankfurt.de/service-und-rathaus/presse/texte-und-kampagnen/interviews/hochhausentwicklung-in-frankfurt

Baldwin Hess, D., Tammaru, T., & Van Ham, M. (2018). *Housing estates in Europe*. Springer.

Baulinks. (2015). *Bundesweite Studie „Wohnhochhaus Deutschland": Die Mehrheit sieht's positiv* [Nationwide study on high-rise residential buildings in Germany: The majority sees it positively]. https://www.baulinks.de/webplugin/2015/1641.php4

Baumeister, N. (2005). *Stadtgestalt und neue Architektur* [Urban design and new architecture]. Landeshauptstadt München. https://risi.muenchen.de/risi/dokument/v/970991

Baumeister, N. (2021). *Architekturführer München*

[Architectural guide to Munich]. DOM.

Berlinische Galerie. (1991). *Berlin heute* [Berlin today].

Bertram, G. F., & Altrock, U. (2021). *Wachstumsschmerzen.* [Growing pains]. vhw.

Bezirksamt Friedrichshain-Kreuzberg von Berlin. (2004). *Begründung zum Bebauungsplan V–3* [Explanatory statement on land use plan V-3].

Brake, K., & Herfert, G. (Eds.). (2012). *Reurbanisierung* [Reurbanization]. Springer.

Bruns-Berentelg, J., Noring, L., & Grydehøj, A. (2022). Developing urban growth and urban quality: Entrepreneurial governance and urban redevelopment projects in Copenhagen and Hamburg. *Urban Studies*, *59*(1), 161–177.

Charney, I., Drozdz, M., & Rosen, G. (2021). Venerated skylines under pressure: A view of three cities. *Urban Geography*, *43*(7), 1087–1107. https://doi.org/10.1080/02723638.2021.1897742

Colomb, C. (2013). *Staging the new Berlin*. Routledge.

Dorignon, L., & Nethercote, M. (2021). Disorientation in the unmaking of high-rise homes. *Transactions of the Institute of British Geographers*, *46*(2), 363–377.

Dörry, S., & Handke, M. (2012). Disentangling the geography of finance and real estate: Competing space-times of decision-making and uneven spatial development. *Journal of Urban Research*, *9*. https://doi.org/10.4000/articulo.2149

Drozdz, M., Appert, M., & Harris, A. (2018). High-rise urbanism in contemporary Europe. *Built Environment*, *43*(4), 469–480.

Eizenberg, E., Sasson, O., & Shilon, M. (2019). Urban morphology and qualitative topology: Open green spaces in high-rise residential developments. *Urban Planning*, *4*(4), 73–85.

Elser, O., Kurz, P., & Schmal, P. C. (2017). *SOS Brutalismus* [SOS brutalism]. Park Books.

FHH Hamburg. (1996). *Stadtentwicklungskonzept* [Urban development concept].

FHH Hamburg. (2007). *Räumliches Leitbild Entwurf* [Spatial model draft].

FHH Hamburg. (2014). *Innenstadtkonzept Hamburg 2014* [Inner city concept Hamburg 2014].

Fishman, R. (2011). The open and the enclosed: Shifting paradigms in modern urban design. In T. Banerjee & A. Loukaitou-Sideris (Eds.), *Companion to urban design* (pp. 50–60). Routledge.

Flagner, B., & Schick, R. (2017). Wie komponiert man eine Stadt? *Bauwelt*, *19*, 58–67.

Flecken, U. (2000). *Zur Genese der Nachmoderne im Städtebau* [On the genesis of post-modernism in urban planning]. TU Berlin.

Frenkel, A. (2007). Spatial distribution of high-rise buildings within urban areas: The case of the Tel-Aviv metropolitan region. *Urban Studies*, *44*(10), 1973–1996.

Gibson, J. L. (1994). *The early high-rise in Germany: A study in modernism and the creation of a modern metropolis*. The Ohio State University.

Glauser, A. (2020). *Vertical Europe*. Campus.

Graham, S. (2015). Luxified skies: How vertical urban housing became an elite preserve. *City*, *19*(5), 618–645.

Grant, J. (2005). *Planning the good community*. Routledge.

Greco, E. (2018). Questioning the vertical urbanization of post-industrial cities: The cases of Turin and Lyon. *Built Environment*, *43*(4), 555–570.

Haberlik, C. (2004). *Neue Architektur in München* [New architecture in Munich]. Nicolai.

Hackenberg, K., Oostendorp, R., & Wiegandt, C.-C. (2010). Schöne Städte durch große Pläne? Baukultur und integrierte Stadtentwicklungsplanung [Beautiful cities through big plans? Building culture and integrated urban development planning]. *Raumforschung und Raumordnung|Spatial Research and Planning*, *68*(6), 483–497.

Hall, P. (2014). *Cities of tomorrow* (4th ed.). Wiley.

Hamburg. (2022). *Über den Dächern der Hansestadt* [Above the roofs of the Hanse city]. https://www.hamburg.de/sehenswuerdigkeiten/4401242/hochhaeuser-in-hamburg

Hamburgische Architektenkammer. (Ed.). (1989–2022). *Jahrbuch Architektur in Hamburg* [Yearbook Architecture in Hamburg]. Junius.

Harnack, M. (2014). *Rückkehr der Wohnmaschinen* [Return of the housing machines]. transcript.

Harris, A. (2015). Vertical urbanisms: Opening up geographies of the three-dimensional city. *Progress in Human Geography*, *39*(5), 601–620.

Helleman, G., & Wassenberg, F. (2004). The renewal of what was tomorrow's idealistic city: Amsterdam's Bijlmermeer high-rise. *Cities*, *21*(1), 3–17.

Herlyn, U. (1970). *Wohnen im Hochhaus* [Living in high-rise buildings]. K. Krämer.

Hilgenstock, V. (2011). *Projektentwicklung von Bürohochhäusern* [Project development of high-rise office buildings] [Doctoral dissertation, HafenCity Universität Hamburg]. rePOS HCU. https://repos.hcu-hamburg.de/bitstream/hcu/507/1/DissHilgenstock.pdf

Hoffmann, L. (2000). Hochhäuser im Banne der Kirchtürme: München [High-rise buildings under the spell of church towers: Munich]. In M. Rodenstein (Ed.), *Hochhäuser in Deutschland: Zukunft oder Ruin der Städte?* [High-rise buildings in Germany: Future or ruin of the cities?] (pp. 193–213). Springer.

Howoge. (2022). *Lichtenberg: Frankfurter Allee 135*. https://www.howoge.de/wohnungsbau/neubauprojekte/frankfurter-allee-135.html

Jonak, U. (2018). Verlust der Bodenhaftung [Loss of traction on the ground]. In U. Jonak (Ed.), *Essays zur Architektur* [Essays on architecture] (pp. 123–126). Springer. (Original work published 2001)

Jourdan, & Müller PAS. (1998). *Frankfurt 2000 Hochhausentwicklungsplan* [Frankfurt 2000 high-rise development plan]. Stadt Frankfurt.

Jung, A. (2016, November 22). Wohnen in der Vertikalen [Living in the vertical]. *Der Spiegel*. https://www.spiegel.de/wirtschaft/unternehmen/deutschland-erlebt-renaissance-der-wolkenkratzer-a-1121953.html

Kabisch, S., Poessneck, J., Soeding, M., & Schlink, U. (2022). Measuring residential satisfaction over time: Results from a unique long-term study of a large housing estate. *Housing Studies*, *37*(10), 1858–1876. https://doi.org/10.1080/02673037.2020.1867083

Kalantari, S., & Shepley, M. (2021). Psychological and social impacts of high-rise buildings: A review of the post-occupancy evaluation literature. *Housing Studies*, *36*(8), 1147–1176.

Kiefer, A. (2016, November 18). Wenn Häuser in den Himmel wachsen [When houses grow into the sky]. *Handelsblatt*. https://www.handelsblatt.com/finanzen/immobilien/beliebte-wohntuerme-wenn-haeuser-in-den-himmel-wachsen-/14862346.html

Lampugnani, V. M., & Mönninger, M. (Eds.). (1991). *Berlin morgen* [Berlin tomorrow]. Gert Hatje.

Lange, R. (2008). *Architektur in Hamburg* [Architecture in Hamburg]. Junius.

Lehrer, U. A. (2002). *Image production and globalization*. University of California.

Lippert, R. K. (2019). *Condo conquest*. UBC Press.

Lukas, T. (Ed.). (2007). *Crime prevention in high-rise housing*. Duncker & Humblot.

Marktreport: Fast 80 neue Wohnhochhäuser in Deutschland bis 2018 [Market Report: Almost 89 New Residential High-Rises iin Germany by 2018]. (2016, February 25). *DFPA*. https://www.dfpa.info/maerkte-studien-news/marktreport-fast-80-neue-wohnhochhaeuser-in-deutschland-bis-2018.html

McCall, V., & Mooney, G. (2018). The repoliticization of high-rise social housing in the UK and the classed politics of demolition. *Built Environment*, *43*(4), 637–652.

Merkel, N. M. S. (2018). *Hybride Hochhäuser mit Wohn- und Büronutzung* [Hybrid high-rise buildings with residential and office use]. Bedey Media.

Meyhöfer, D. (2005). Im Nest—New Falkenried als Zugewinn für die Innere Stadt [In the nest—New Falkenried as a gain for the inner city]. In Hamburgische Architektenkammer (Ed.), *Jahrbuch Architektur in Hamburg* [Yearbook Architecture in Hamburg] (pp. 36–45). Junius.

Michel, J. H. (2005). Problems with high-rise buildings in Cologne and Munich. *Heritage at Risk*, 73–75.

Müller-Raemisch, H.-R. (1996). *Frankfurt am Main: Stadtentwicklung und Planungsgeschichte seit 1945* [Frankfurt am Main: Urban development and planning history since 1945]. Campus.

Nethercote, M. (2022). *Inside high-rise housing*. Policy Press.

Pappe, S. (2013). *Architekturführer Frankfurt am Main* [Architectural guide to Frankfurt am Main]. DOM.

Power, A. (1999). High-rise estates in Europe: Is rescue possible? *Journal of European Social Policy*, *9*(2), 139–163.

Precht von Taboritzki, B. (2000). Bleibt der Dom der Kölner Hochhauskomplex par excellence? [Will the cathedral remain Cologne's skyscraper par excellence?]. In M. Rodenstein (Ed.), *Hochhäuser in Deutschland: Zukunft oder Ruin der Städte?* [High-rise buildings in Germany: Future or Ruin of the Cities?] (pp. 154–170). Springer.

Rauterberg, H. (2008). Vorne die Reeperbahn, hinten die Buchsbaumterrasse [In front of the Reeperbahn, behind the boxwood terrace]. In Hamburgische Architektenkammer (Ed.), *Jahrbuch Architektur in Hamburg* [Yearbook Architecture in Hamburg]. (pp. 10–14). Junius.

Reicher, C., & Söfker-Rieniets, A. (2021). *Stadtbaustein Wohnen* [Urban building block housing]. Springer.

Rodenstein, M. (Ed.). (2000a). *Hochhäuser in Deutschland: Zukunft oder Ruin der Städte?* [High-rise buildings in Germany: Future or Ruin of the Cities?]. Springer.

Rodenstein, M. (2000b). Von der „Hochhausseuche" zur „Skyline als Markenzeichen"—Die steile Karriere der Hochhäuser in Frankfurt am Main [From the "high-rise epidemic" to the "skyline as a trademark"—The steep career of high-rise buildings in Frankfurt am Main]. In M. Rodenstein (Ed.), *Hochhäuser in Deutschland: Zukunft oder Ruin der Städte?* [Future or Ruin of the Cities?] (pp. 15–70). Springer.

Schendel, D. (2021). *Architekturführer Berlin* [Architectural guide Berlin]. DOM.

Schendel, D., Meuser, N., & Düwel, J. (2018). *Architekturführer Hamburg* [Architectural guide Hamburg]. DOM.

Schenk, L. (2017). Das Wohnhochhaus als Stadtbaustein–eine Wettbewerbskritik [The residential high-rise as an urban building block – a competitive critique]. *Bauwelt*, *19*, 8–17.

Schipper, S., & Wiegand, F. (2015). Neubau-Gentrifizierung und globale Finanzkrise. Der Stadtteil Gallus in Frankfurt am Main zwischen immobilienwirtschaftlichen Verwertungszyklen, stadtpolitischen Aufwertungsstrategien und sozialer Verdrängung [New building gentrification and global financial crisis. The Gallus district in Frankfurt am Main between real estate exploitation cycles, urban policy upgrading strategies and social displacement]. *sub\urban*, *3*(3), 7–32.

Schreiber, D. (1977). *München—Untersuchung Hochhausstandorte* [Munich—Investigation of high-rise building locations]. City of Munich.

Schreiber, D. (1995). Fortschreibung Hochhausstudie von 1977 [Update high-rise building study of 1977]. In: Landeshauptstadt München (Ed.), *Hochhausstudie* [High-rise building study] (pp. 68-130). City of Munich.

Schubert, D. (2000). Hochhäuser in Hamburg—(Noch) kein Thema? Geschichte, Gegenwart und Zukunft

eines ambivalenten Verhältnisses [High-rise buildings in Hamburg—Not (yet) an issue? History, present and future of an ambivalent relationship]. In M. Rodenstein (Ed.), *Hochhäuser in Deutschland: Zukunft oder Ruin der Städte?* [High-rise buildings in Germany: Future or Ruin of the Cities?] (pp. 231–254). Springer.

Senate Berlin. (1993). *Projekte der räumlichen Planung* [Spatial planning projects].

Senate Berlin. (1999). *Planwerk Innenstadt Berlin: Ergebnis, Prozeß, Sektorale Planungen und Werkstätten* [Master Plan Inner City Berlin: Outcome, process, sectoral planning and workshops].

Senate Berlin. (2020). *Hochhausleitbild für Berlin* [High-rise model for Berlin].

Skyline Atlas. (2022). *Hochhaus-Entwicklungsplan 2022 für Frankfurt* [High-rise development plan 2022 for Frankfurt]. https://www.skylineatlas.de/rahmenplaene/hochhausentwicklungsplan-2022

Speer, A., & Praeckel, D. (1984). *Frankfurt am Main: Leitplan Dezember 1983* [Frankfurt am Main: Master plan December 1983]. Unpublished manuscript.

Stadt Frankfurt. (2008). *Hochhausentwicklungsplan Frankfurt am Main: Fortschreibung 2008* [High-rise development plan Frankfurt am Main: Update 2008]. https://www.stvv.frankfurt.de/parlisobj/M_106_2008_AN2.pdf

Stadt Frankfurt. (2022). *Hochhausentwicklungsplan 2021* [High-rise development plan 2021]. https://www.stadtplanungsamt-frankfurt.de/hochhausentwicklungsplan_frankfurt_am_main___fortschreibung_2008_5801.html?psid=28b66001c8ffd3e8080deea3e094a33e

Stadt München. (2022). *Umgang mit Hochhäusern im Stadtgebiet* [Dealing with high-rise buildings in urban areas]. https://stadt.muenchen.de/infos/umgang-hochhaeuser-stadtgebiet.html

Strom, E., & Mayer, M. (1998). The new Berlin. *German Politics & Society*, *16*(4), 122–139.

Thiel, F. (in press). Vertikale Bodenpolitik. Stadt-„Sanierung" durch (hybride) Hochhäuser in Frankfurt am Main [Vertical land policy. Urban "redevelopment" through (hybrid) high-rise buildings in Frankfurt am Main]. In U. Altrock, R. Kunze, D. Kurth, H. Schmidt, & G. Schmitt (Eds.), *Stadterneuerung und Spekulation* [Urban regeneration and speculation]. Springer.

Thiel, F., & Mach, V. (2020). "Buying the air"—Planning and land policy interventions for hybrid high-rises in Frankfurt am Main. *disP*, *56*(4), 10–23.

Thompson-Fawcett, M. (2003). A new urbanist diffusion network: The Americo-European connection. *Built Environment*, *29*(3), 253–270.

Turkington, R., Van Kempen, R., & Wassenberg, F. (Eds.). (2004). *High-rise housing in Europe*. Delft University Press.

Unternehmer für die Region Köln, & AS+P. (2008). *Städtebaulicher Masterplan Innenstadt Köln* [Urban master plan inner city Cologne].

van Damme, M., Krapf, S., & Wagner, M. (2021). Housing density and its consequences for couples in Germany: Staying, moving, or breaking up? *Housing Studies*. Advance online publication. https://doi.org/10.1080/02673037.2021.1961694

van Kempen, E., & Musterd, S. (1991). High-rise housing reconsidered: Some research and policy-implications. *Housing Studies*, *6*(2), 83–95.

vhw. (2018). *Bürgerbeteiligung in der Stadtentwicklung und im Wohnungsbau* [Citizen participation in urban development and housing].

Wentz, M. (2022). Der Frankfurter Westhafen [Frankfurt West port]. *RaumPlanung*, *216*(2), 14–21.

Weyer, A. (2020). *Architekturführer Köln* [Architectural guide Cologne]. DOM.

Wijburg, G., & Aalbers, M. B. (2017). The alternative financialization of the German housing market. *Housing Studies*, *32*(7), 968–989.

Wikipedia. (2022a). *Liste der Hochhäuser in Berlin* [List of high-rise buildings in Berlin]. https://de.wikipedia.org/wiki/Liste_der_Hochhäuser_in_Berlin

Wikipedia. (2022b). *Liste der Hochhäuser in Hamburg* [List of high-rise buildings in Hamburg]. https://de.wikipedia.org/wiki/Liste_der_Hochhäuser_in_Hamburg

Wikipedia. (2022c). *Liste der Hochhäuser in München* [List of high-rise buildings in Munich]. https://de.wikipedia.org/wiki/Liste_der_Hochhäuser_in_München

Wikipedia. (2022d). *Liste der Hochhäuser in Köln* [List of high-rise buildings in Cologne]. https://de.wikipedia.org/wiki/Liste_der_Hochhäuser_in_Köln

Wikipedia. (2022e). *Liste der Hochhäuser in Frankfurt* [List of high-rise buildings in Frankfurt]. https://de.wikipedia.org/wiki/Liste_der_Hochhäuser_in_Frankfurt

Wu, W., & Ge, X. J. (2020). Communal space design of high-rise apartments: A literature review. *Journal of Design and Built Environment*, *20*(1), 35–49.

Yuan, B., & Yeh, A. G. O. (Eds.). (2011). *High-rise living in Asian cities*. Springer.

Zabel, T. (2020). *Towers of Germany*. FBV.

Zukin, S. (1988). The postmodern debate over urban form. *Theory, Culture & Society*, *5*(2/3), 431–446.

Zupan, D. (2021). De-constructing crisis: Post-war modernist housing estates in West Germany and Austria. *Housing Studies*, *36*(5), 671–695.

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