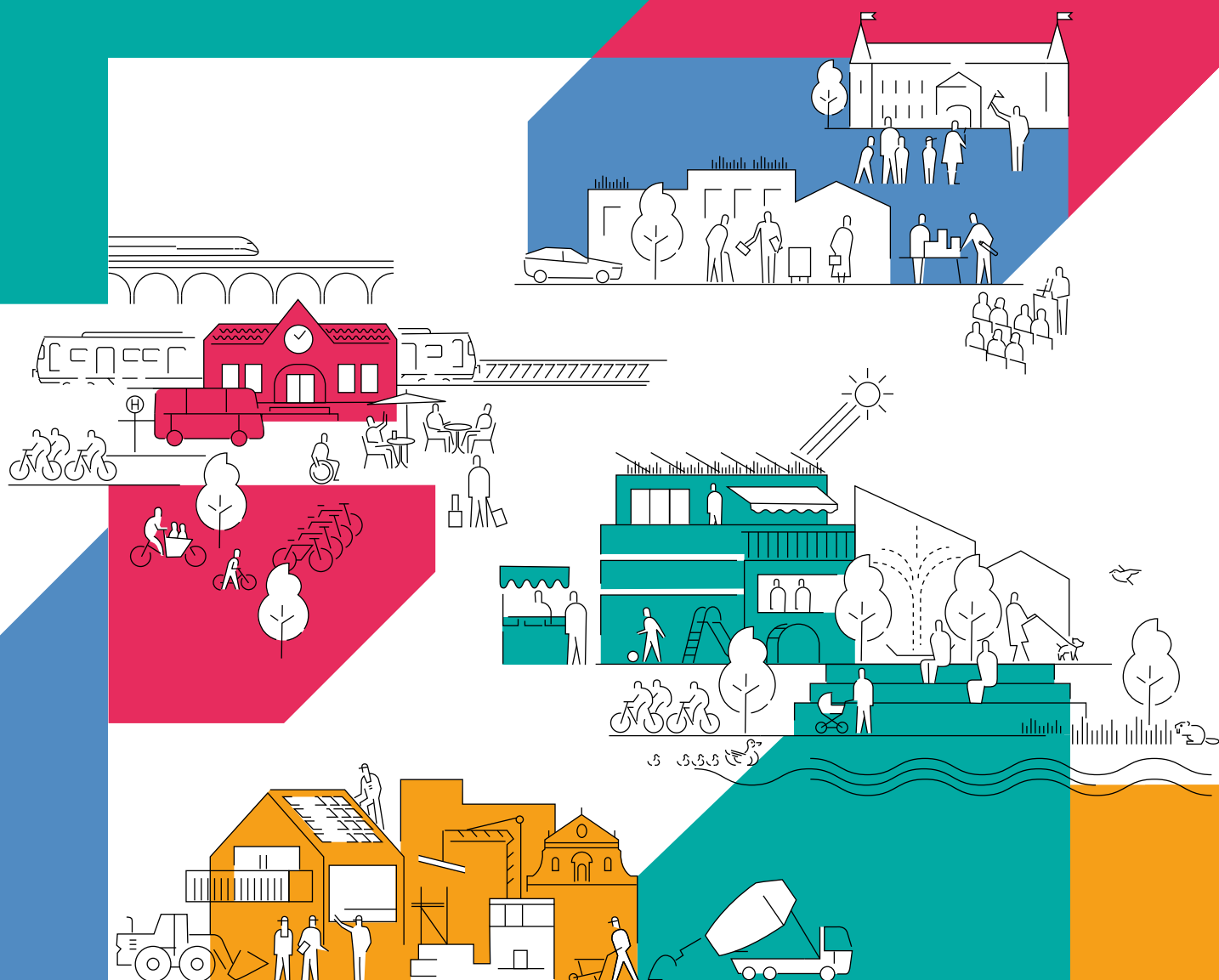


Baukultur Report

Baukultur of Conversion

2022/23



Publisher:
Federal Foundation of Baukultur
Reiner Nagel

Management:
Inga Glander

Project Participation:
Natalie Hipp, Bettina Preuße, Dr. Achim Reese

Contributions:
Dr. Isabel Klocke, Ira Mazzoni

Study:
Wuppertal Institut für Klima, Umwelt, Energie gGmbH

Population Survey:
forsa – Gesellschaft für Sozialforschung und
statistische Analysen mbH

Layout and Graphics:
Heimann + Schwantes

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Andreas Meichsner Photography
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Baukultur Report

Baukultur of Conversion

2022/23

Baukultur Report 2022/23 – Summary of the Recommendations for Action

Make conversion the new model!

Versatile locations, a reliable infrastructure and attractive, climate-compatible living spaces must be the paramount objectives of future designs. Existing qualities in our cities, towns and landscapes must be identified and made usable as the starting point and inspiration for further development.

→ **Redesign city centres for diversity of use and flexibility!**

Cities and municipalities need a functional mix of retail, catering, leisure offers and culture as well as housing, education, commercial, production and social offers in their centre that is appropriate to their identity.

→ **Implement climate adaptation with a Baukultur of Conversion!**

Adaptation measures necessitated by climate change must be linked to Baukultur concerns, in order to generate real added value for society that extends beyond pure functionality.

→ **Develop resilient infrastructures!**

The mobility transition and climate protection require extensive adaptation of an infrastructure that in many places is already in a desolate condition due to a lack of care and maintenance. Baukultur must become the guiding principle for solving the tasks that arise in a truly sustainable way.

Ring in a paradigm shift to a Baukultur of Conversion!

The focus of politics, administrations, the construction industry and the public must shift from new build to conversion if only for economic and ecological reasons. This paradigm shift offers opportunities for climate and resource protection, for a new understanding of design and for structures which will also still be valuable for future generations.

→ **Realise that existing building stock is the key to climate protection!**

It is not operating energy that is decisive for climate protection, but the emissions generated during production, operation and dismantling. Existing building stock should therefore also always be given priority over new build because this conserves valuable resources.

→ Use golden energy!

The existing building stock is not only valuable due to the emissions stored in it, known as grey energy, but also for intangible, cultural reasons. Seeing and communicating its value is a task for society as a whole. The participants in planning and construction must recognise the inherent golden energy of the existing building stock and develop a new design language for dealing with the existing stock.

→ Make convertibility the bedrock!

Structures should be designed so that subsequent changes in use and conversions can be implemented as easily and as compatibly with the climate as possible. Flexibility and a convertible construction method directed at the life cycle, which nevertheless focuses on permanence in design and material selection, must become basic premises of design.

Gear structures to the new Baukultur of Conversion!

After decades of focussing on new build, it is now necessary to dismantle existing structures and standards and realign them in the interests of a Baukultur of Conversion. There is an extensive need for adaptation in the legal and financial frameworks as well as in practised processes in administration and the construction industry.

→ Adapt framework conditions!

Both incentive systems and regulations can help conversion measures become more important compared to new build. The principles of standardisation and approval procedures need close scrutiny.

→ Recognise the responsibility of the public authorities!

Ecological, social and Baukultur responsibility should be exercised in the municipalities on an equal footing with financial responsibility. The public authorities must show the way by example and consistently promote, support and enable conversion projects in their advisory capacity. Contract award criteria must be adapted in the interests of sustainability and retention of the existing building stock.

→ Focus on Phase Zero and Phase Ten!

The requirements planning and preliminary investigations of Phase Zero and the maintenance measures of Phase Ten are essential for a Baukultur of Conversion. Projects must be comprehensively weighed up and be well-placed to consider the characteristic features of the existing building stock, to keep in mind subsequent care, maintenance and convertibility and avoid premature dismantling.

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Introduction

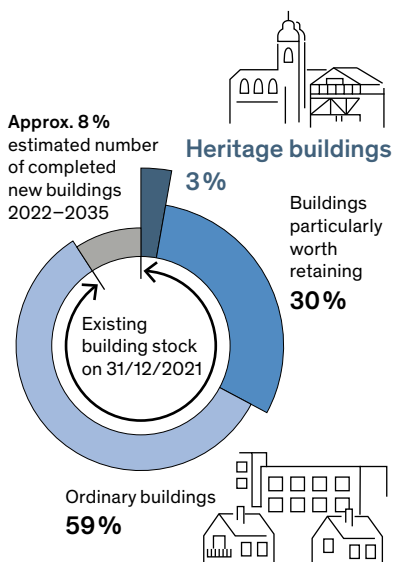
Fifty years ago, the Club of Rome unambiguously drew attention to the finite nature of our planet's resources. Since then, building has continued more than ever globally, including in Germany – as if the limits to growth didn't exist. In 2022, Earth Overshoot Day, which marks the date when humanity has used all the natural resources the Earth can provide within a year, fell on 28 July. For Germany, the Earth Overshoot Day was on 4 May, the day of the Baukultur Convention in Potsdam, which addressed resource issues for planning and construction in Germany and represented the kick-off of a new Baukultur of Conversion.

The global pandemic of recent years, Russia's war in Ukraine and the associated energy and material bottlenecks, as well as the continuing financial crises act as disruptive factors on our previous model of planning and building by means of new build projects. The construction, planning and design disciplines are facing a fundamental change. For decades, demolition and replacement new build were just as much a matter of course as the designation of building land on greenfield sites. It is now becoming clear that without conversion as an auspicious sign of our social carbon footprint, we can no longer slow down global warming. We need a rethink, a new mindset and a new culture anchored in the Baukultur of Conversion. This change can only be achieved successfully if the Baukultur values of the existing building stock are recognised, held in higher regard and if the legal and financial frameworks are adapted. A new Baukultur of Conversion can therefore be an effective way to take greater control of our actions and make the transformation process productive and personally fulfilling.

Above all, existing buildings shape our built environment

Existing building stock by 2035 according to an estimate of the Federal Foundation of Baukultur

Sources: BDA NRW 2016; dena 2021; Destatis 2021



Besides the main topic of Baukultur of Conversion, the Baukultur Report 2022/23 gives an overview of the current situation of Baukultur in Germany. With growing cities, already discussed in the Foundation's first report in 2014/15, the demand for affordable housing also continues. The problem, which is long since no longer limited to the large cities only, has been further exacerbated by a shortage of skilled workers and material bottlenecks. The attempt to counter the resulting price increases with reduced Baukultur quality seems questionable. Instead, in view of the federal government's announcement that 400,000 homes would be created each year through new build and conversion of existing buildings, it is necessary to emphasise attractive architectural and urban planning design as well as carefully considered planning processes.

The negative effects that uncontrolled growth has on villages and cities includes the "doughnut effect" discussed in the 2016/17 report: The proliferation of residential and commercial buildings in the surrounding areas is accompanied by desolation of the town centres. In its handbook, "*Besser Bauen in der Mitte*" (Building Better in the Centre), the Federal Foundation of Baukultur used successful examples to demonstrate that this development can be countered by clever planning and by retaining or renewing towns as "filled doughnuts". An increasing number of municipalities are abstaining from designating new building areas, and are instead promoting the purchase and upgrading of centrally located

existing buildings. The 2018/19 report showed that the retention of formative buildings of the townscape is especially important in terms of establishing identity. At the same time, changing standards must be met by new uses.

The fact that shopping facilities, for example, are no longer a guarantee for vibrant town centres also became evident as a result of the coronavirus pandemic. However, the 2020/21 report clearly showed that changing shopping behaviour is by no means the only challenge for our centres and the design of public spaces. Rather, when creating open spaces, the needs resulting from climate adaptation, the necessary increase in biodiversity, a changing work environment and an increasingly needed mobility transition must also be taken into account.

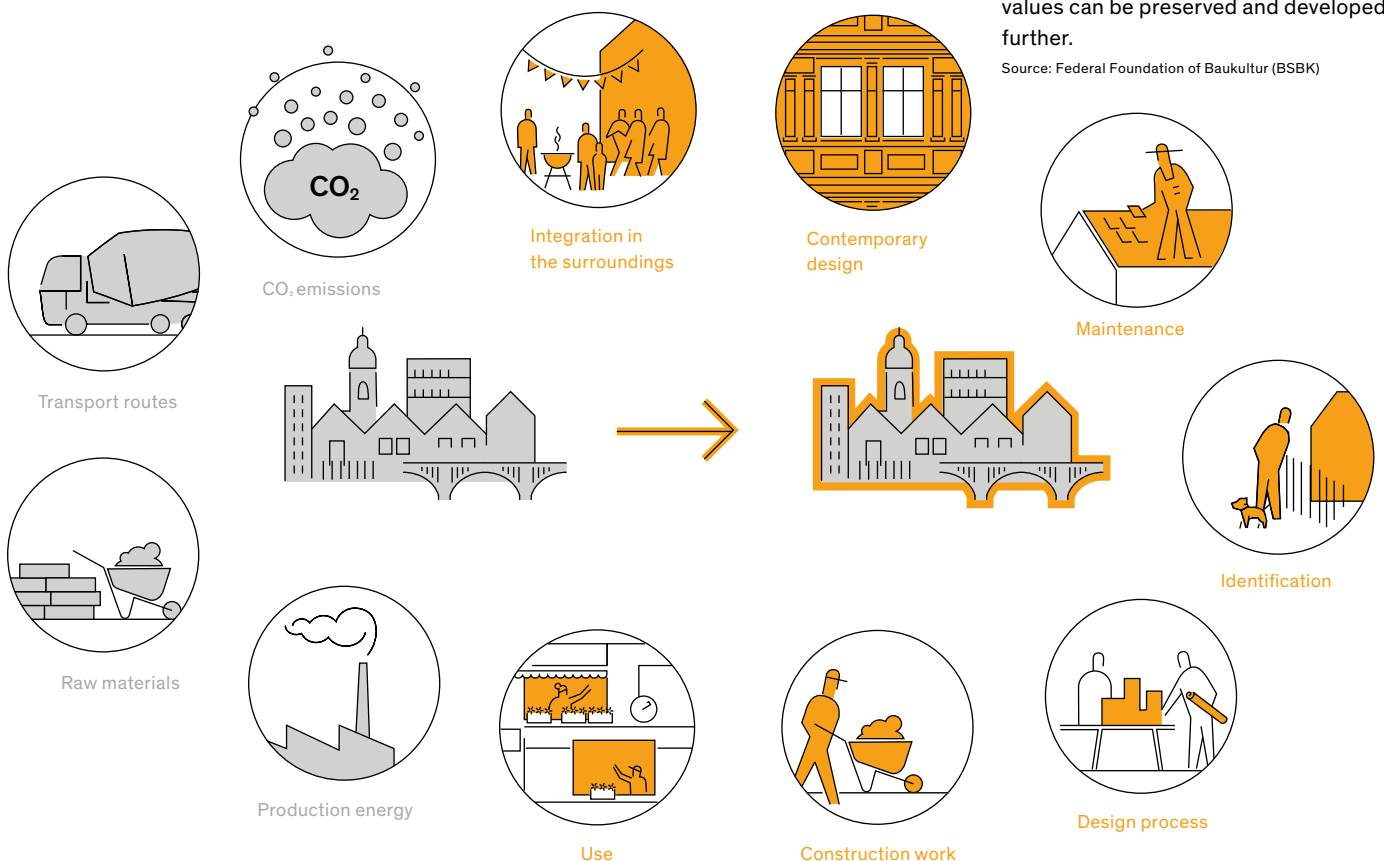
Baukultur also includes process culture. Only carefully designed processes supported with engagement, which result in the creation of commitments, can guarantee attractive proposals and projects. Therefore, one of the central tasks of the Federal Foundation of Baukultur is to motivate all stakeholders of planning, design and building, across all professional groups, to cooperate successfully.

With the Baukultur of Conversion, the Baukultur Report 2022/23 addresses a topic whose projection in the future requires an active paradigm shift now. The demand to retain existing buildings wherever possible and to adapt them to changing needs through conversion can also be seen as an answer to climate change. After all, according to the evaluation of a research team led by Werner Sobek, more than half of global greenhouse gases can be traced back to the construction and building sector.

From grey energy to “golden energy”

By retaining the existing building stock, not only tangibles but also intangible values can be preserved and developed further.

Source: Federal Foundation of Baukultur (BSBK)



The demolition of existing buildings and the erection of energy-efficient new buildings is only a supposed solution. A substantial part of the energy used by a new building during the course of its life is due to its actual construction. This grey energy is unfortunately still not considered in many laws and funding guidelines and therefore generally remains unused when existing buildings are demolished. Merely maintaining the status quo, however, is not an alternative. A conversion accompanied by an energy upgrade would be sustainable in every respect. This is also seen on an urban scale, in the adaptation to the no longer avertible consequences of climate change through green and blue infrastructures.

These rational reasons alone, however, will not help an increasingly necessary *Baukultur* of Conversion to be successful. Rather, it is necessary to recognise the social and cultural importance of the existing building stock and take into account its emotional importance. Similar to the term grey energy, the Federal Foundation has thus coined the term “golden energy” to describe the intangible and intrinsic values inherent in the structures, but which also considers their characteristic construction and historical features. Compared to new buildings, existing buildings are often characterised by their evolved integration in the urban planning context and at the same time they offer a particular identification potential. They attest to the work of those who designed, built, converted and maintained them, while at the same time also providing evidence of the life of previous users. Finally, they are integrated in social environments and are linked to specific uses, which cannot simply be “rebuilt” elsewhere in the case of demolition.

The potential of a new *Baukultur* of Conversion can only be conjectured at the present time. This especially applies to its economic consequences. The conversion of office buildings into residential buildings could open up new opportunities for the overheated housing market in the densely populated cities. More senior citizens could use the opportunity to redesign detached houses to be accessible and also to possibly divide them into multiple units and could thus also provide new urban planning perspectives for our detached housing areas. In view of increasing material prices, retention of the existing building stock should make a significant contribution to the cost stability of building – while the higher quality conversion would help make skilled trades acquire new appeal and can thus also provide an answer to the shortage of skilled workers.

The work process for producing the *Baukultur* Report 2022/23 itself attempts to meet the Federal Foundation's standard of good, interdisciplinary collaboration. It was produced with numerous professionals, taking into account pertinent experiences. The fundamentals for the report can be traced back to a team of experts from the Federal Foundation, which was supported and advised by an extended group of external experts in different disciplines. In addition, the foundation commissioned the Wuppertal Institut für Klima, Umwelt, Energie (Wuppertal Institute for Climate, Environment, Energy) to implement a conceptual research project on the climate-compatible handling of the existing building stock.

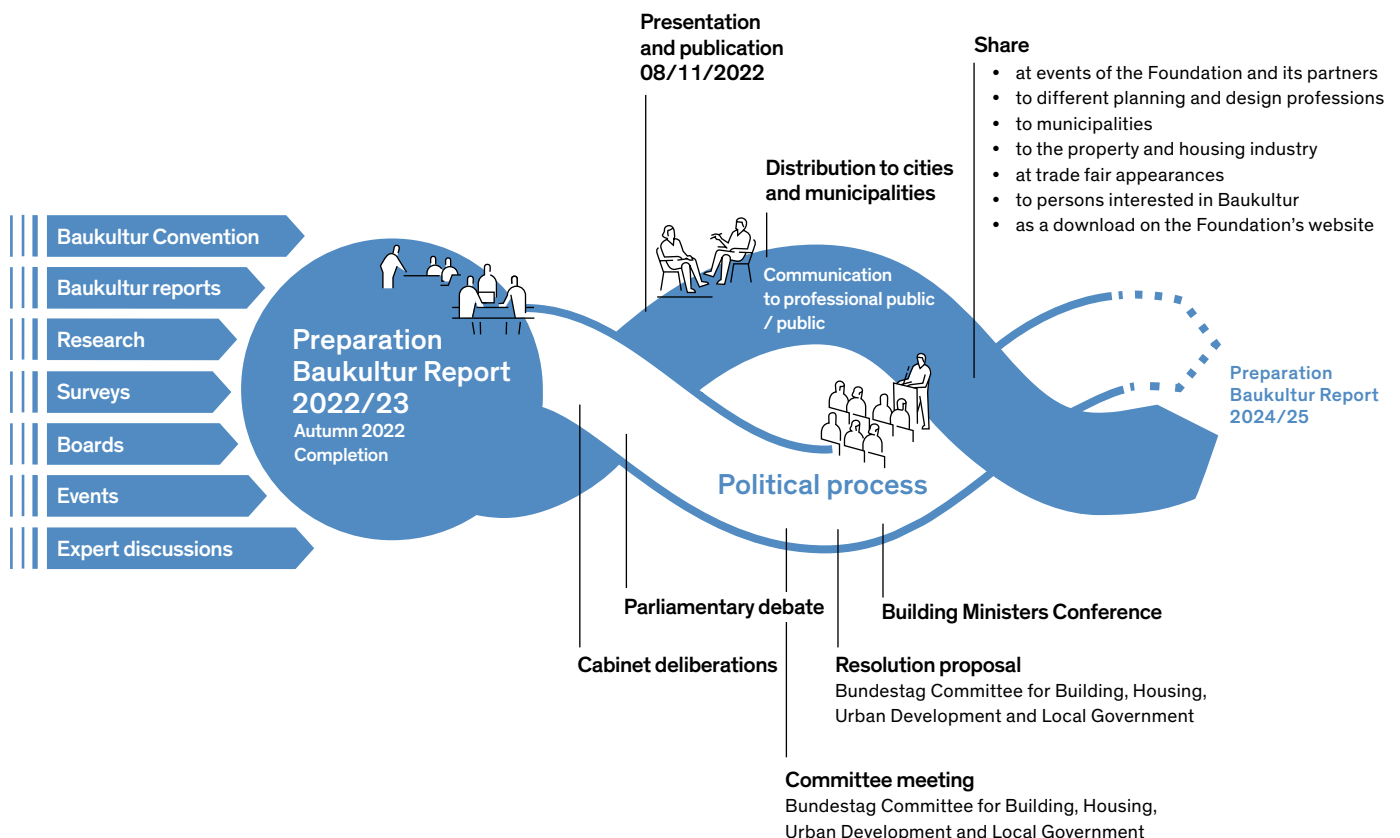
This was followed by four central *Baukultur* Workshops and a series of *Baukultur* Dialogues and professional discussions. At the *Baukultur* Workshops, in which building professionals from different disciplines participated, various aspects of a new *Baukultur* of Conversion were addressed: “Converting living

spaces” in Schwäbisch Gmünd, “The opportunities of a new Baukultur of Conversion” in Dortmund, “Conversion – Rethinking” in Bielefeld and finally “Baukultur of Conversion – Rethinking Regions, Cities and Neighbourhoods” in Stuttgart. With the help of a nationwide search, twelve projects were selected, which were presented and discussed in the Baukultur Workshops. These projects are now presented in pictures and text and are also summarised by project descriptions naming all project participants. They help to illustrate the findings and recommendations.

Four surveys were conducted on the needs situation and to obtain feedback from those in the field: a population survey, a survey of cities, towns and municipalities, a survey of the skilled trades and a survey of planning and design professionals. The graphic preparation of the results of the surveys and content-related searches simplifies understanding of the at times complex relationships that the new Baukultur of Conversion requires. The findings acquired then finally result in recommendations for action directed at politics and policymakers, administration, the planning and design professions, the construction and property industry, as well as at initiatives and the interested public.

The political and social path of the Baukultur Report 2022/23

Source: Federal Foundation of Baukultur 2022



The Current Situation of Baukultur in Germany

Every two years, the Federal Foundation of Baukultur presents a report on the Baukultur situation in Germany. It contains specific recommendations for action for politics and policymakers and everyone involved in planning, design and construction, although they are also intended for anyone interested in Baukultur. The focal points of the reports are continued, the range of their topics is still current: Cities and their Baukultur priorities (2014/15), relationships between large, medium-sized and small cities and rural areas (2016/17), dealing with our Baukultur heritage (2018/19) and the importance of public spaces (2020/21).

Public Spaces and City Centres

City Centres in Crisis The coronavirus pandemic has clearly shown and accelerated the gradual loss of function of the city centres. The broad concentration on retail during the past ten years has displaced other uses from the city centre. Pedestrian zones are often primarily shopping streets and are not an attractive place to linger, particularly after closing time. In the past, city centre locations were only affordable for a few, and always the same, chain stores. The result was market concentration: While the number of retail businesses has decreased, the sales area per premises has grown significantly. A larger choice and better opportunities to compare prices are not the only reasons why Germans increasingly shop online. The unvaried and interchangeable offers also contribute to the situation.

The pandemic accelerated the growth of e-commerce still further: In 2020, the industry recorded a 23 % growth in sales. The result is a downward spiral in the city centres, which has made their one-sided orientation and monotonous design crisis prone. This situation gave rise to the two position papers, “*Stoppt den Niedergang unserer Innenstädte*” (*Stop the decline of our city centres*) and “*So kommen Handel und Innenstädte aus der Krise*” (*How trade and city centres can survive the crisis*), which the Federal Foundation of Baukultur, together with the Deutscher Verband für Wohnungswesen, Städtebau und Raumordnung (German Association for Housing, Urban and Spatial Development), the Handelsverband Deutschland (German Retail Federation) and urbanicom (German association for urban development and trade), published in September 2020 and October 2021. The change into a multifunctional and thus resilient city centre with recreational quality is a central conversion task of many small, medium-sized and large cities. Decisive steps in this direction mentioned in the municipal survey were: Create housing space, create and redesign open spaces, and set up kindergartens and child day care centres. The municipalities should link these measures to climate adaptation, the mobility transition and other pressing tasks.

Wish for Vibrant Town Centres

71% of the population would like more diverse use of the town centre, for example, through housing, cultural offers and shopping options. 76 % are in favour of fewer vacant shops. [P3](#)

Development Concepts for the City Centre

Almost all cities (92 %) already have a model, an integrated or a spatial concept for the development of their city centre or are working on it. Among the rural municipalities the figure is 62 %. [M3](#)

The Condition of Public Spaces While the city centres remained empty, green spaces and parks were very popular during the pandemic. This is confirmed by two surveys conducted in German cities by forsa on behalf of the Bundesverband Garten-, Landschafts- und Sportplatzbau (Federal Association of Gardening, Landscaping and Sportsground Construction) in 2020 and 2021: Both times, around half of the respondents stated that the importance of urban green spaces had increased for them during the coronavirus pandemic. However, one in five also stated that the maintenance condition and cleanliness of the facilities had worsened from 2020 to 2021 – a logical consequence of the more intensive use. Against the background of their growing importance, the pressure caused by use and design deficits, the calls from the Baukultur Report 2020/21 to increase maintenance budgets, coordinate cross-departmental municipal accountabilities for the public space and consolidate responsibilities, are even more relevant. In some municipalities, for example in Hamburg and Nuremberg, the responsibilities for the public space are already held by one body. In the Berlin district of Friedrichshain-Kreuzberg, a new “Public space” department was created in 2021, which among other things is responsible for park management of the green spaces, property management and approvals for events and special uses.

Living, Working and Mobility

The Land Issue Land plays a leading role in the debate on climate adaptation, affordable housing and the social city. Scarcity and high demand have consequences: According to the price index for building land, the prices for building plots rose by 102 % from 2010 to 2020. Anyone who used land as an investment, was able to profit from the price trend and in some cases chalk-up a passive return. If properties are kept unused for speculation reasons, the city lacks development land for urgently needed housing in the meantime. Frequently, the high price of a plot of land can ultimately only be compensated for by the sale or rental of high-priced apartments. Drastically increasing land prices not only displace people with low or average incomes to the periphery, land also becomes scarce for uses relevant for urban society, such as small skilled trades and commercial business or kindergartens and schools. A Bündnis Bodenwende (Land Use Transition Alliance) was therefore formed as a nonpartisan coalition of architecture and land-use planning academies, chambers, associations and foundations, which calls for a new land policy with a change in taxation and rights of ownership.

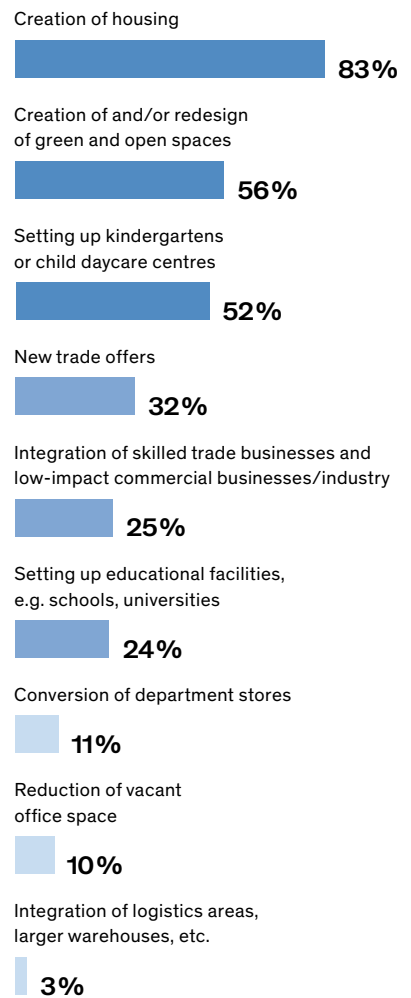
Options and suggestions for this were included in the Baukultur Report 2014/15 – for example, strategic property management with differentiated allocation routes and the municipalities own land ownership. The reports that followed discussed these in greater detail with recommendations for action such as “Pursue an active land policy!” or “Establish responsible land and property policy!”. Since then, many cities such as Aachen and Munich have implemented a “concept procedure” or building lease clauses (see *Land Policy* chapter).

New Living, New Working The parties of the federal government coalition anchored the target of creating 400,000 homes per year in the coalition agreement of 2021. 100,000 of these are to be publicly funded. This ambitious target will not

Objectives for the development of the city centre and town centre

Source: Municipal survey for the Baukultur Report 2022/23

The municipalities name the following as current fields of action for the development of city and town centres:



be able to be achieved by new build alone. It is therefore necessary to also satisfy the demand for housing through the conversion and repurposing of existing buildings. The *Germany Study 2019* conducted by the Technische Universität Darmstadt and the Pestel Institute in Hanover assumes that in saturated property markets, for example, 350,000 apartments could be created by repurposing the surplus of office and administration buildings. Contrary to the assumption that the expansion of working from home will lead to substantial numbers of vacant office properties after the pandemic, the Institut der deutschen Wirtschaft (German Economic Institute) in Cologne and the *Spring Property Industry Report 2022* forecast that only a few companies will reduce their office space.

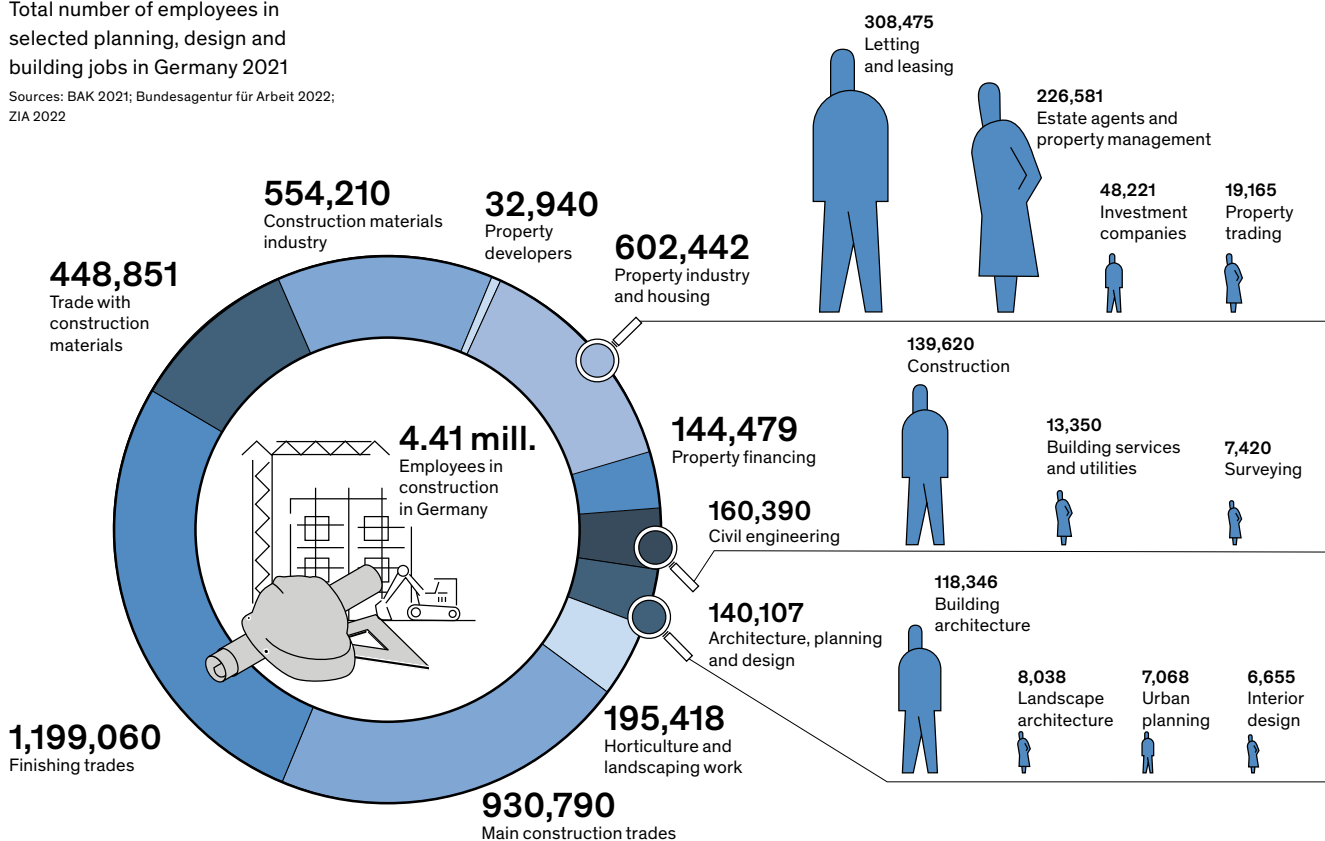
All targets for the creation of housing must take into consideration the capacities of the construction industry, which are determined by a worsening shortage of skilled workers and material. A survey by the ifo Institute in September 2021 showed that a third of building contractors had problems finding skilled workers. In civil engineering the figure was 37.4 %. In April 2022, one in two companies complained of material delivery bottlenecks – in building and in civil engineering.

Changing Mobility More mobile working could reduce commuter traffic, relieve the pressure on cities and facilitate their development from car-friendly to people-friendly places. With the start of the pandemic, in April 2020, Germans spent four times as much time bicycling than beforehand. Cities such as Berlin, Düsseldorf and Munich set up pop-up cycle routes – quickly implemented, temporary cycle routes on car lanes or parking areas. Several are to be developed into permanent routes. Larger traffic trials took place elsewhere – and not only against the

Construction employment

Total number of employees in selected planning, design and building jobs in Germany 2021

Sources: BAK 2021; Bundesagentur für Arbeit 2022; ZIA 2022



background of the pandemic: In Lübeck in 2020, the Beckergrube, a street in the old part of the city, was provisionally modified to offer space for consumption-free occupancy, more parking spaces for bicycles and spaces for initiatives and activities. Local public transport, pedestrian and bicycle traffic were given higher priority. Following a successful test, it is important to consolidate temporary structures in high urban space and built quality: The street in Lübeck will now be modified and the traffic permanently rearranged. These approaches show how the role of individual car traffic is currently changing. To this end, multimodal-based traffic concepts were already recommended in the Baukultur Report 2014/2015.

Convergence of City and Land

Housing Wishes of the Population Particularly in the large German cities, the housing situation is now considered to be dramatic. A forecast by the Bundesinstitut für Bau-, Stadt- und Raumforschung (BBSR, Federal Institute for Building, Urban Affairs and Spatial Development) says that the population growth in the large cities will continue in the coming years. The housing shortage problem will therefore likely become increasingly worse. However, a snapshot in time reveals a different picture: Not only municipalities in the suburban belt of larger cities, but also tracts of land outside the classic suburbanisation areas are recording migration gains. In contrast, the population gains of the seven largest cities, have been consistently smaller in recent years. In cities such as Cologne and Stuttgart, the number of inhabitants has even decreased recently. In the BBSR’s assessment, this is also due to families that can no longer afford the sharply increased rents and purchase prices in the large cities. According to the *Spring Property Industry Report 2022*, the trend increased still further due to the pandemic and more working from home. In addition, there are declining migration gains from abroad, as well as a general new “Landlust” – a longing for the countryside. The unabated dream of a detached house may also contribute to the latter: According to a survey by the property finance company Interhyp, in 2021, 65 % of the population preferred this form of housing. A stronger demand for detached single family homes can lead to more land use whenever new building areas are designated. In the years from 2016 to 2020, an average of 54 hectares of settlement and traffic area per day was used. It remains to be seen whether this number can be lowered to the interim target of 30 hectares per day by 2030. If new settlement and traffic areas are added, the competition for land with agriculture and nature conservation, and to an increasing extent with the generation of renewable energy, intensifies.

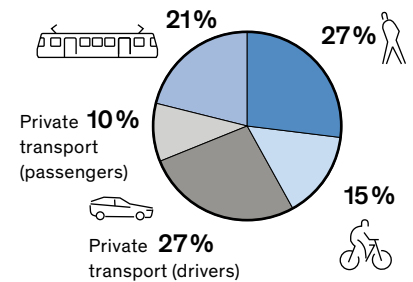
Public Services Municipalities that designate new building areas must expect follow-up costs for development and social infrastructure. An important factor in the choice of place of residence is the development of broadband, although there has been a reduction in the white spots that existed in many regions. Just like the retail trade, the sustainability of municipal public services offers (whether for local public transport, energy and water supply, education or outdoor swimming pools and hospitals) is highly dependent on the number of inhabitants and catchment areas. Several communities have problems answering the question about which other services they as a municipality can offer, if at all.

Modal split

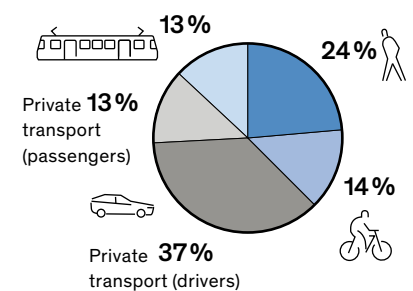
Distribution of traffic volume between the different means of transport (modal split)

Source: Agora traffic transition 2020

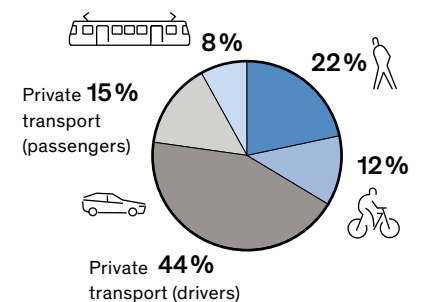
Metropolises



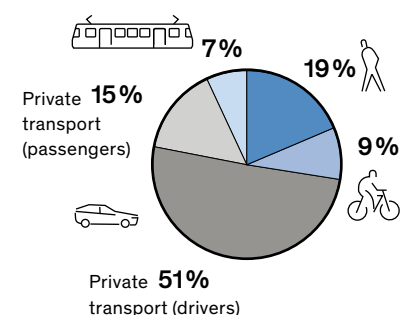
Large cities



Medium-sized cities

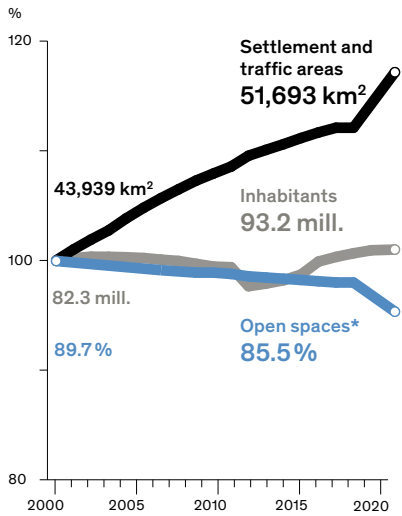


Small cities



Unequal developments

Sources: Destatis 2021, 2022; UBA 2022



* Agricultural land, forest and forestry land, uncultivated land, mining/quarrying and spoil area and water area

Growing municipalities are faced with the challenge of integrating new offers into existing structures. In the *Baukultur Report 2016/17* and in the *Building Better in the Centre* handbook, the Federal Foundation of Baukultur showed how municipalities counteract the doughnut effect of sprawling settlement edges and emptying town centres and use the potential for brownfield development.

Baukultur and Climate Protection

Current Trends For a long time, the significance of construction for the climate remained generally unrecognised. Yet the construction and building sector is substantially responsible for climate change: According to the United Nations Environment Programme (UNEP), it causes almost half of the energy-related CO₂ emissions worldwide. At the end of 2019, the EU passed the voluntary political agreement, the “European Green Deal”, to achieve climate neutrality by 2050. Apart from creative initiatives such as the “New European Bauhaus”, guidelines such as the “Renovation Wave” action plan for non-refurbished buildings and the EU taxonomy, which defines sustainable investments, generate a sense of urgency for the German construction and property industry to act.

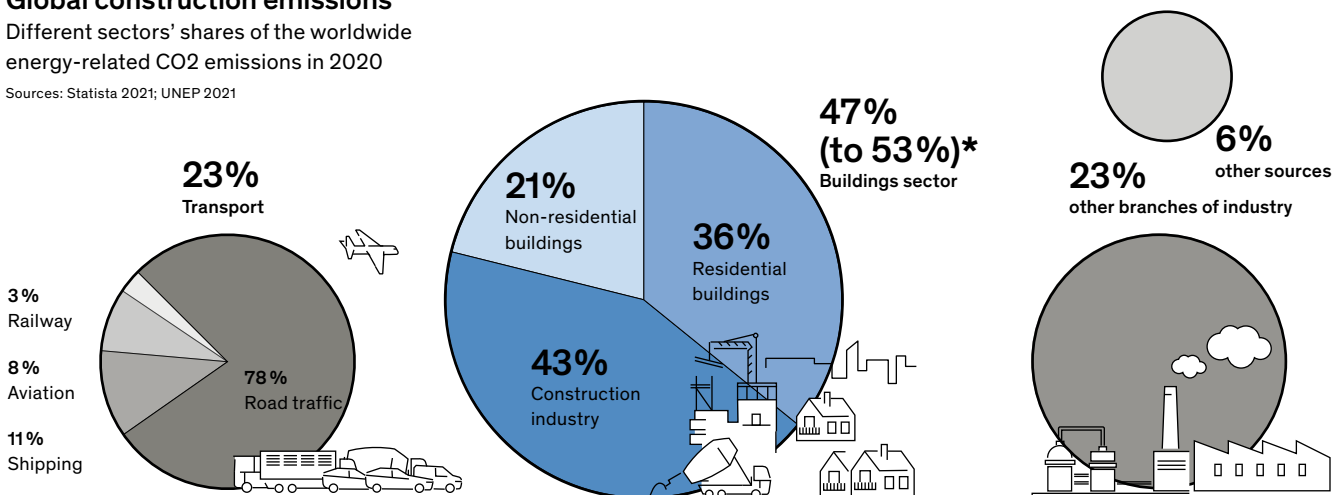
Many professional associations had already taken a stance beforehand: the Bund Deutscher Architektinnen und Architekten (BDA, Association of German Architects), for example, with its position paper “*Haus der Erde*” (Planet Home), and the Bund Deutscher Baumeister, Architekten und Ingenieure (BDB, Association of German Master Builders, Architects and Engineers) with a *Climate Building Plan*. Nonprofit initiatives such as “Bauhaus Earth” and “Architects for Future” (A4F) advance the paradigm shift in building. The existing building stock is increasingly understood to be the “key to achieving climate targets”.

In the *Baukultur Report 2018/2019*, the Federal Foundation of Baukultur confirmed the particular role of existing building stock in the climate transition, and the current report also shows that safeguarding the existing stock is equally beneficial for climate protection and the preservation of cultural values.

Global construction emissions

Different sectors' shares of the worldwide energy-related CO₂ emissions in 2020

Sources: Statista 2021; UNEP 2021



* Studies that also take into account the process-related release of greenhouse gases as well as those emissions due to production and demolition, which are usually attributed to other categories such as industry or mobility, estimate the share of the construction and building sector to actually be above 50%

Baukultur of Conversion The Starting Position

Whereas conversion was still the norm in the premodern era, the 19th century saw the emergence of a will for radical innovation whose effect has continued up to the present. A lack of appreciation and neglect of the existing building stock lead to its demolition and replacement new buildings. Changing needs could be responded to equally well with a conversion. New build-oriented structures in planning and construction, however, are often an obstacle and make demolition and new build appear more economically promising.

Baukultur of Conversion – a Review

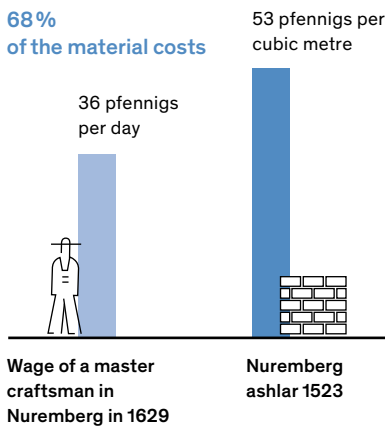
Climate protection and scarcity of resources increase the importance of retaining existing building fabric. A paradigm shift is in the offing: Instead of new build, building in existing fabric will become the norm. A Baukultur of Conversion is nothing new. Before the upheaval of the modern age, retaining existing structures and their circumspet continuance was common practice. A look back can provide information about which methods lead to longevity and convertibility. In a new Baukultur of Conversion, existing structures are converted and new ones are erected, representing added value not only for the present day generation but for many generations to come.

Conversion – a Supplanted Cultural Technique

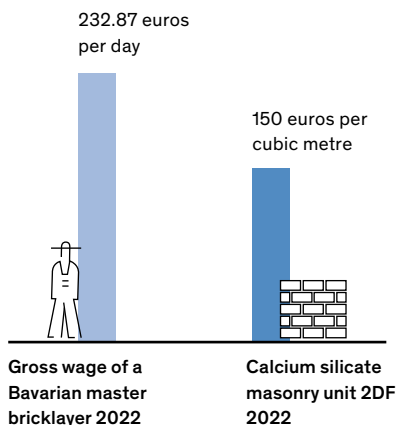
Construction costs then and now

Ratio of daily wage to material price

Sources: Destatis 2018; Fouquet 1998; Hornbach 2022



155% of the material costs



Successful Strategies of European Baukultur of Conversion In pre-industrial times, buildings were primarily converted, extended and/or repurposed. Houses were maintained, repaired and in due course adapted to changed climatic, political, economic and societal conditions. Demolishing and rebuilding from scratch was out of the question solely for economic reasons: Building materials were in short supply and expensive, however, labour was relatively inexpensive. New build therefore mostly only occurred if a fire or war had destroyed neighbourhoods. Otherwise, the maxim was: what already exists does not have to be procured, processed and installed.

Tradition played a large role. Accordingly, the work of preceding generations was largely respected. Diverse conversion strategies ensured that new features nonetheless developed: annexes, additional storeys or cladding provided space for changed uses. It is thanks to this conversion practice, which was taken for granted that Europe has a many-faceted Baukultur heritage, which keeps history in mind.

Ancient ruins were frequently used as quarries in the Middle Ages and in the early modern period. The already perfectly processed building material was not only appreciated as a valuable resource, but also due to its symbolic content. The large ancient buildings also often offered preconditions for unusual architectural and urban planning adaptations. In the German city of Trier, the Porta Nigra (Black Gate) was retained because an eremite had retreated into the Roman city gate. After his death and canonisation in 1035, the mighty gate was developed into a double church. The ancient architecture remained visible as a constitutive element of the mediaeval transformation.

Almost every castle illustrates that making new additions is an old conversion strategy. The further development of the complexes was for defence purposes, improved the supply of water and food and enabled more comfortable living. Building work on palaces also continued over centuries. Starting from a mediaeval fortress, for example, the Louvre developed into the residence of French kings and emperors as well as the public administration. It is astonishing that – despite the objective of forming an axis-symmetrical complex – the façades of the different wing buildings were never harmonised. Napoleon said his reasons for this were thrift, common sense and good taste.

The conversions and modifications to Heidelberg Castle herald the rise of the Palatine House of Wittelsbach, whose members were made electors in the 14th century. Repeatedly adapted, particularly in the 16th and 17th centuries, the conversion history of the castle has been continued in years past – most recently by the redesign of the former tack room into a restaurant.

A decidedly quality economy led to precise examination of the existing building and its development possibilities. In *Truth and Fiction*, Goethe describes how his father had the two inherited half-timbered houses in the Hirschgraben in Frankfurt converted from the bottom up to form one new whole, while the household was arduously kept going. The old main house and an outbuilding on its gable side had been built in around 1600, each still with the upper storeys protruding into the street (called “jetties”). New building regulations since the mid-18th century forbade jettying. If he had opted for new build, Johann Caspar Goethe would therefore have had to forfeit living and floor space. Thanks to the conversion, however, he gained space for a staircase hallway, his library and an art collection. A new mansard roof and a wide transverse gable added almost a full storey to the house. Johann Caspar Goethe was not the only one in the street to extend his property in this way. The modernised houses nonetheless remained recognisable as half-timbered buildings.

Conversion of the European City City maps bear witness to the long history of conversion, repurposing and overbuilding. The infrastructure is frequently longer lasting than the buildings. In Munich, the junction of Salzstraße, vital for the mediaeval city, with a rural road is now the Marienplatz square and the centre of the city as well as being a central underground and urban rail node.

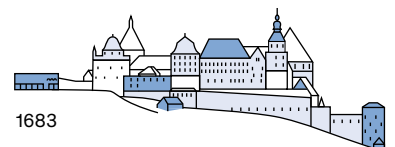
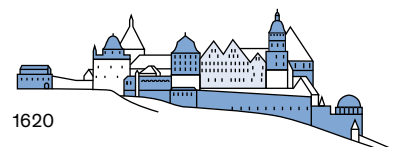
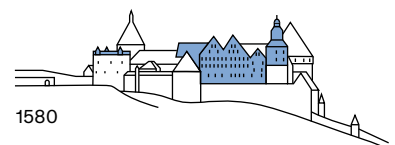
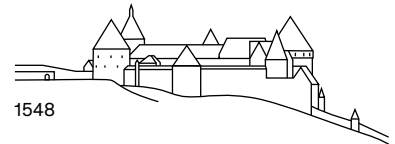
Until the beginning of the 19th century, most cities developed within the most recently built city walls and fortifications. Despite close economic links, there was a clear boundary between the city and its landscape. Urban development was brownfield development, during which the municipal infrastructure was successively improved: Roads were cobbled, water pipes laid, lifting and pumping stations were built and were often impressively staged. Concentration, continuity and complexity characterised the old city. Yet in times of strong population and economic growth, the bulwarks became a hindrance. The inner fortress of Vienna had lost its strategic function with the construction of the outer wall in the 18th century. Emperor Joseph II had roads and footpaths built on its glacis and thousands of avenue trees were planted. The new city green space gave the citizens living in confined conditions the opportunity to relax in the fresh air. As in Vienna, the former fortifications gave way to green belts and wide ring roads almost everywhere.

No other European city in the 19th century was rearranged as methodically and radically as Paris. After three revolutions and several cholera epidemics, the Prefect Haussmann “slit open the belly of” old Paris “by a central swathe” – as he himself wrote. It was necessary to make the city accessible to traffic, especially the railway, and to create controllable order. The mediaeval cité was a victim of these initial major redevelopments. Where 14,000 people had still lived and worked in 1856, then became an administrative centre. The new hygiene standards of the capital, which extended over 8,700 hectares, included water pipes and a functioning sewer system. Uniform, mainly stately buildings with shops, cafés and rental apartments in the storeys above were erected along the wide

Baukultur of Conversion in Times Past

Conversion work on Heidelberg Castle from 1548 to 1683

Source: Federal Foundation of Baukultur after Julian Hanschke



roads lit by gaslight. This Paris still influences the idealised image of the European city to this day. In terms of a Baukultur of Conversion, it was always worthwhile, even on a city level, to examine what existed and uncover dormant potential – especially if necessary infrastructure measures could be linked to added value for the urban community.

Changing values

Modern Times Powerfully eloquent manifestos and programmes characterise the modern age since the beginning of the 20th century. Their tenor: the new age and the new human need new architecture. “Such architecture cannot be subjected to any law of historical continuity. It must be new like our mindset”, wrote Antonio Sant’Elia in 1914, in the catalogue of the “The New City” exhibition. Light, air, sun and green instead of dark backyards were what the avant garde promised. (Social) hygiene was at the centre of the considerations. New constructions with new building materials (such as concrete, steel or glass), rationality and efficiency in design and execution were intended to lead to a future designed with the needs of people in mind, as quickly and as inexpensively as possible. Industrial production, standardised elements and standardisation processes helped to reduce the construction costs but also influenced style. Following the radical progress narrative of the modern age, in the architectural history fixated on new build, there are hardly any indications of conversion activities in those times. And yet they existed.

In the period between the world wars, characterised by a shortage of energy, material and money, it would not have been possible to deal with the housing shortage in the cities with new build alone. At the end of 1919, the young Weimar Republic could look back on 61,000 apartments built. However, almost half were the result of a conversion (for example, of barracks) or attic conversions. Only after the currency reform in 1924 did the share of emergency-induced conversions fall below 10 %. A manual published in 1932 by Konstanty Gutschow and Herrmann Zippel, titled *Conversion*, presented 86 examples, among other things for façade changes, shop installations, division into apartments, additional storeys and repurposing. It essentially involved modernisations in the New Objectivity style.

Reconstruction and a New Start after 1945 After World War II, there were numerous controversies about whether and how the bombed cities were to be rebuilt. Those who advocated for a radical new start referred to the guiding urban planning concepts of the 1920s and the Charter of Athens, which Le Corbusier had phrased “The functional city” in 1941, in the aftermath of the CIAM Congress. It provided for extensive disentangling of housing, working, leisure and traffic. The French planning staff designed “Ideal plans for the future” with an explicit link to Le Corbusier for the cities of Saarbrücken, Saarlouis and Mainz, 80% of which had been destroyed. In 1947, the US Forces sent Walter Gropius, former Director of the Bauhaus and a professor at Harvard University for ten years, to Germany to push forward the structural new beginning of democracy.

After the rubble had largely been removed, however, mostly very pragmatic reasons led to rebuilding of the old city with simplified building methods. Especially if the utility networks for water, wastewater, gas and electricity under the roads

were still intact, it was natural to keep to the old city layout. On the other hand, in Berlin, Hamburg and Hanover, after the rubble clearance and demolition, whole districts were replanned from the ground up. In Berlin's Hansaviertel area, *Interbau 1957*, a model open and green residential development, was created for the International Building Exhibition.

The use of rubble bricks was unavoidable in the first phase of reconstruction. This also laid down a marker architecturally, however: against the war and for a new humility. Hans Döllgast, for example, repaired the badly damaged Alte Pinakothek in Munich with rubble bricks. The bomb crater is still apparent to this day in the architecture of the repaired museum. And after there were protests in Berlin against the planned demolition of the war-damaged Kaiser Wilhelm Memorial Church, Egon Eiermann changed his winning design and surrounded the burnt-out tower with four new buildings. He thus created one of the most impressive church ensembles in Germany.

Initially, there were also lively discussions in the Soviet occupation zone about concepts that ranged from preserving reconstruction to open construction through to new establishments. The centralised city planning of the GDR (former East Germany), the state's control of the land and the changeover to industrial building led in some cases to radical transformations of city centres, which were intended to signify the start of a new period. The government deliberately avoided the word *reconstruction*. The Construction Act of 1950 named nine cities, which were to be reorganised based on Soviet models with central squares and main streets: Berlin, Dresden, Leipzig, Magdeburg, Chemnitz, Dessau, Rostock, Wismar and Nordhausen. Nevertheless, the lack of money and material forced the continued use of old buildings, as the housing construction targets were missed by far.

Baby, Construction and Car Boom After the initial building phase, building policy focus turned to the renovation of the old city neighbourhoods spared by the war. Several of these districts were hopelessly over-occupied by the homeless and refugees. The sanitary conditions were catastrophic. Hardly anyone had bothered with maintenance during the years of need. The initial objective of remedying the structural and hygienic shortcomings soon shifted to redevelopments in which whole residential and trade neighbourhoods had to give way to new administration, office, commercial or transport buildings, with a reference to supposed functional weaknesses. The first Promotion of Urban Development Act that came into effect in 1971 gave the municipalities the instruments needed to develop redevelopment areas quickly. Because the federal government and states contributed to the redevelopment costs and the public authorities paid for restitution, the costs of demolition, the relocation of tenants and the reorganisation, new build with more space appeared more attractive than conversion for many property owners.

Living on the edge of the city or in surrounding municipalities in the countryside became the ideal of young families, which contributed to the urban sprawl. New satellite towns were intended to eliminate the continuing housing shortage due to the enormous growth in population. The post-war record in West Germany was achieved in 1973 with 714,000 apartments completed. But the further living and working moved apart spatially, the more commuter traffic increased. A car boom correlated with the baby boom and construction boom. Urban planning

responded with the model of the “traffic-orientated city”. In many places, the historic structure of the city was found to be unfit and was sacrificed for wide roads, new openings, city ring roads, bypasses, bridges, car parks and multistorey car parks.

Orderly Landscapes As part of the federal statutory land consolidation in the decades after World War II, small plots of land fragmented by the division of an estate due to inheritance were merged to form large units, in order to expedite industrial modernisation of agriculture.

The interventions had far-reaching consequences: In the 1970s, environmental protection and community heritage activists protested against the land consolidation. Farmers worried about their livelihoods also rebelled against land planning that made it difficult for small and medium-sized farms to survive. In May 1983, *Der Spiegel* magazine established that 56 % of the agricultural land in West Germany had been “smoothed”: 90,000 kilometres of new roads had been paved and 40,000 kilometres of streams and rivers had been straightened. Due to the disappearance of dry and wet meadows, water meadows and bogs, hedges and small shrubs, the extinction of species had reached unimagined proportions.

The landscape remodelling was also not without its consequences from a Baukultur point of view: Many cultural landscapes were severely reshaped or even destroyed. Farms had a future only as large farms and were therefore frequently relocated to the edge of town or directly into the open country. Village redevelopments contributed to the breaking up of the traditional mixed farming structures, in order to establish ostensible order and cleanliness.

The local government reorganisation in the 1970s created collective municipalities. This brought new building tasks for administration, schools and health care in its wake. The number of municipalities in West Germany shrank from 24,000 to 8,600.

The Value of Retention and Development At the beginning of the 1970s, the optimism of progress was dampened considerably. In 1972, the Club of Rome drew attention to *The Limits of Growth*. The first oil crisis slowed down the economic upturn globally. Citizen and environmental alliances formed against the demolition of inexpensive apartments in the “Gründerzeit” neighbourhoods in the large cities and against the “major land destruction”. In the European Architectural Heritage Year 1975, the Deutsche Nationalkomitee für Denkmalschutz (German National Committee for Monument Protection) announced by poster: “House by house, your home is dying – our living environment needs protection. Monument Protection”. For the first time, building was denounced as environmental destruction and a culture of preservation was thought of in integrated terms. Built heritage protection targeted “the whole”, the “abundance and diversity” of the areas of life. The Gründerzeit neighbourhoods discredited by the modern age shifted into the centre of interest, while the urban planning of the post-war time was condemned as a second destruction. At the same time, the urban planning model also changed: Urban renewal instead of urban expansion became the primary objective. 1975 thus rang in the era of ensemble protection – both in the East and in the West. Although the GDR was not involved in the Architectural Heritage Year, the Monument Protection Act passed that year replaced the earlier ordinances. An increased interest in protecting the old town centres, which came out of the Gründerzeit

neighbourhoods in Berlin, Halle and Leipzig, also found its way into teaching at the universities (for example, at the TU Dresden).

Berlin’s Senator for Building, Harry Ristock, put the “Retention and further development of the neighbourhoods” on his agenda. For the International Building Exhibition 1987 in West Berlin, Hardt-Walther Hämer developed socially inclusive concepts for circumspect renewal of old city neighbourhoods. Individual groups were already designing images for further ecological conversion of the housing blocks.

The amendment of the urban development funding in 1984 and the start of the federal research programme on “Experimenteller Wohnungs- und Städtebau“ (ExWoSt, Experimental housing and urban planning) strengthened the revitalising conversion of city neighbourhoods and villages still further. Following reunification, the “Städtebaulicher Denkmalschutz” (Urban Heritage Protection) programme was established in order to restore and revitalise derelict historical city centres and neighbourhoods. In addition, in 2002, the “Stadtumbau Ost” (Urban Redevelopment East) programme was started in Berlin and the eastern German states. Apart from strengthening the city centres, the more than 1,200 measures were aimed at reducing the number of vacant buildings. Residential buildings were also demolished, which were then later lacking on the housing market. With the “Stadtumbau West” (Urban Redevelopment West) programme started two years later, the attempt was made to counter the consequences of demographic and economic structural change in the other German states, too. Since 2017, both programmes have been united under the title “Stadtumbau” (Urban Redevelopment).

Starting in 1989, Emscher Park International Architecture Exhibition, a programme set up for ten years, showed that a Baukultur of Conversion cannot only support and inform structural and social change, but can also shape it. For the ecological and economical conversion of a cultural landscape characterised by heavy industry, the “Werkstatt für die Zukunft” (Workshop for the future), under the direction of Karl Ganser, pointed the way by developing new potential spaces for art, education, trade, housing and leisure and realising them with highly diverse stakeholders.

The conversion of barracks, railway facilities, slaughterhouses, breweries and other commercial operations gave many cities in the 1990s the opportunity to implement compact urban redevelopment. Wherever formative (and often listed) buildings of the townscape were included, vital mixed neighbourhoods were created: in the French Quarter in Tübingen, in the southern Palatinate town of Landau and in Leipzig-Plagwitz.

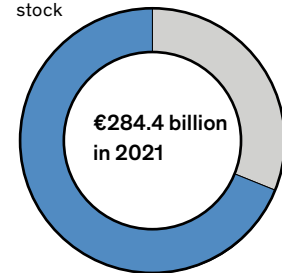
In cultural history terms, conversion is therefore the normal condition of Baukultur. Even the reconstruction mostly took place on the basis of already created urban infrastructure. In this way, conversion projects throughout Germany in recent years have succeeded, mostly moderated by townscape or built heritage protection and supported by the urban redevelopment funding. At the same time, spectacular new buildings by international architects as well as reconstructions have dominated the public debates. “Old buildings as a resource” was already under discussion in the 1990s, however, demolition and replacement new build were also on the agenda. Only now is the climate-relevant, social, architectonic and urban planning potential of a broad-based Baukultur of Conversion drawing keener attention.

Construction volume: the proportion of conversion is increasing

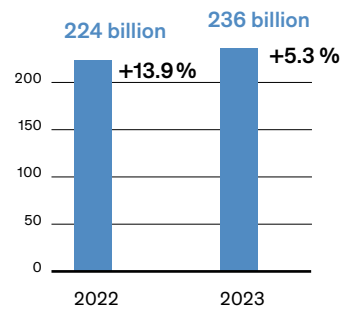
Source: Gornig/Michelsen/Pagenhardt 2022

Construction work in housing

69.1% (€196.6 billion) Existing building stock	30.9% (€87.8 billion) New build
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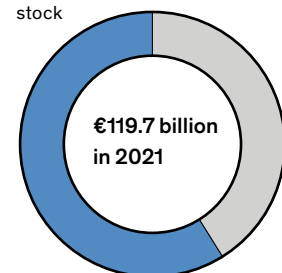


Forecast for construction volume in the existing housing stock

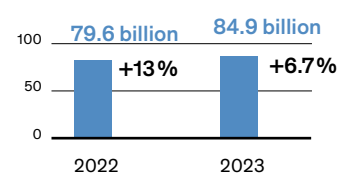


Construction work in non-housing

58.8% (€70.4 billion) Existing building stock	41.2% (€49.3 billion) New build
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Forecast for construction volume in the existing non-housing stock



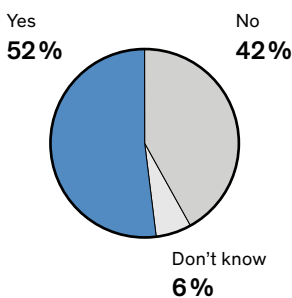
Challenges for a New Baukultur of Conversion

Baukultur stakeholders are becoming increasingly aware of the climate policy importance of the existing building stock. Yet more value is often attributed to the new than the further developed old. In everyday building, the practised decision-making mechanism of “demolition and new build” is perpetuated. Reorientating the processes and structures that have been well-practised for decades is a mammoth task. The aspiration for value-retaining development of the existing building stock and the actual procedure all too often still drift apart. The whole of society must recognise the value of our built environment more and develop visions for a new Baukultur of Conversion.

Every second person said they had already been annoyed by a demolition

Source diagram: Population survey for the Baukultur Report 2022/23; Source text: Municipal survey for the Baukultur Report 2022/23

Have you already regretted or been annoyed by the demolition of a building?



42%

of the cities have experienced demands for the retention of buildings threatened by demolition

17%

of the cities have experienced demands for the demolition of vacant dilapidated buildings

Discovering Existing Building Stock and its Potential

Awareness of the Existing Building Stock We usually pay hardly any attention to our built environment. It is simply there, is one of the things we take for granted in everyday life, in which we have settled and feel at home. Only when a change is looming or occurs does our eye for the quality of the familiar become keener.

In a survey conducted by the Institut für Demoskopie Allensbach (Allensbach Opinion Poll Institute) in 2018, 46 % of the respondents noted that they view new buildings as a threat to their home. It is not a rare occurrence for demolition plans to trigger civic opposition. In other surveys for the Baukultur Report 2018/19, 26 % of those surveyed stated that they had already made a personal commitment to the preservation of a building; 42 % of the municipalities have had to deal with such civic engagement.

In the current population survey for the Federal Foundation of Baukultur, 52 % of those surveyed said they had already been annoyed by a demolition. More than half stated that they are particularly annoyed by demolition if a change in use or conversion would have been possible. A large majority of the population is in favour of examining the quality and conversion potential of a building before a decision is made regarding its demolition.

There are around one million monuments in Germany. 63 % of them are built heritage, which includes individual buildings and gardens, as well as ensembles. Their share of the building stock is difficult to quantify, as the number of non-residential buildings can only be determined approximately. (According to an extrapolation by the Institut für Wirtschaft und Umwelt (IWU, Institute for Economics and the Environment), there are 21 million non-residential buildings in Germany, almost two million of which are heated or cooled.) The approximately 19 million residential buildings are very well recorded statistically. According to the 2011 census, only 13.4 % were built in the period before 1919. Somewhat more than half, namely 9.6 million, were built in the period from 1950 to 1989. However, the Baukultur value of this building age class is frequently considered to be low. This

is also evident from the current municipal survey, according to which only 23 % of the municipalities classify the Baukultur value of their buildings and structures from the 1970s to the 1990s as high or even very high.

Perception and appreciation depend on many factors. Older persons may well remember the wave of demolitions for land redevelopments and city expansions and therefore reject the new buildings of that time. Photos of a premodern half-timbered town also appear attractive to the smartphone generation. This was shown in the debate on the reconstruction of Frankfurt’s war-damaged old city centre, which was built between the cathedral and the Römer (15th century town hall) in place of the Technische Rathaus (administrative building) that had been erected from 1974.

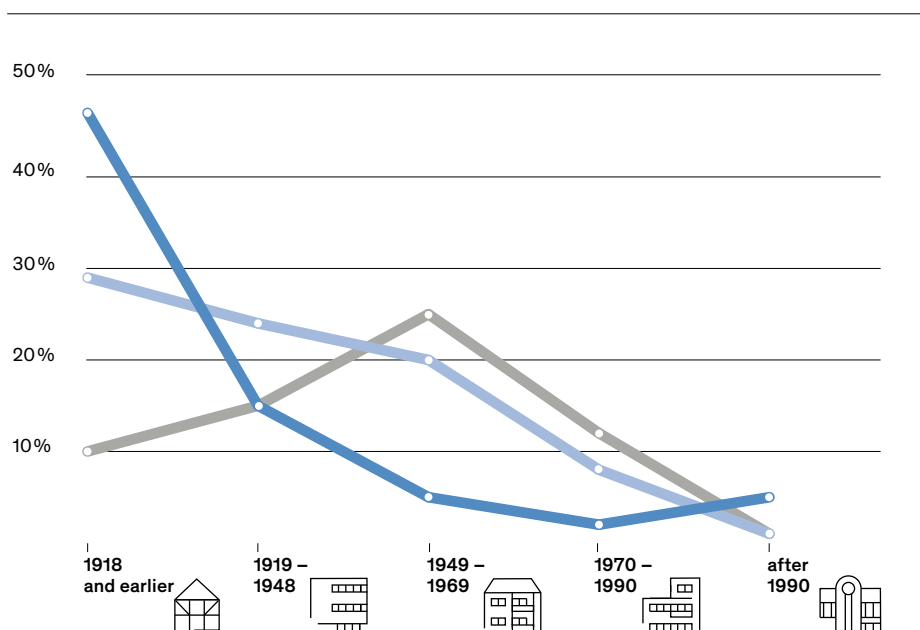
It is frequently aesthetic aspects that bring the aged buildings of the boom years into discredit. Greyed façades and dark concrete are deemed ugly. Today the urban planning model is frequently the metropolises of the 19th century with their perimeter block development. The extensive city and street spaces of the post-war modernity are deemed to be anti-urban. Yet aesthetic judgements are subject to social change. Parts of the younger generation are discovering the sculptural, spatial and social qualities of Brutalism and Eastmodern for the first time and are actively campaigning for their retention and repurposing in initiatives such as “The Brutalists” and “East-modern network”.

External and internal perception can diverge significantly. Interviews conducted by the Bayerischer Rundfunk (Bavarian TV and radio broadcaster) in Neuperlach area on the outskirts of Munich revealed unusually high housing satisfaction and identification with the location. When a high-rise building resident thinks they are “in paradise”, it contradicts the cliché that the largest West German post-war housing development is an anti-humane urban planning derailment. The people who live here value the open spaces with now tall trees, which are more than simply green spaces separating the buildings. Similar differences between internal and external views – already verified in the Baukultur Report 2018/2019 – can also be found in large Berlin housing developments such as

Renovations are more popular than demolition

Almost 80 % of the population would like dilapidated buildings in and around the place where they live to be renovated. Only 26 % also consider the demolition of old and the construction of new buildings as an option.

P3



Little-valued buildings are demolished quickly!

Municipalities’ assessments of Baukultur value, demolition as well as need for conversion and renewal according to building age.

Source: Municipal survey for the Baukultur Report 2022/23

- Perceived high Baukultur value
- Need for conversion and renewal
- (Very) frequent demolitions

the Gropiusstadt and the Märkisches Viertel. The “Creating NEighbourhoods Together” project funded by the New European Bauhaus Initiative therefore focuses on the merits that characterise Munich’s large Neuperlach housing development. Starting with qualities such as a strong feeling of community and an extensive green space offer, the intention is to tackle the neighbourhood’s deficits.

Poor building maintenance and poor care cause a building’s public reputation to quickly lose value. If there are also vacant units, a judgement is made quickly: Even built heritage is then deemed to be an eyesore that must be removed as rapidly as possible.

The task of the monument protection offices of the German federal states is to investigate the existing stocks with built heritage value, to develop and communicate scientifically sound criteria for placing them under protection. In late 2018, in its position paper *Denkmalschutz braucht Grundlagen* (Monument protection needs principles), the Deutsche Städtetag (Association of German Cities and Towns), reminded us that the work on producing an inventory must be intensified. Due to the high pressure for change, “substantial” losses of heritage buildings of the recent past, whose value is mostly still unknown, is to be expected. The Deutsche Städtetag, which represents 3,400 cities and municipalities, bemoans that: “With an uncontrolled substantive or design loss, Germany faces the loss of Baukultur history and identity.” Yet the financial and personnel situation, especially of the departments responsible for the inventory, has worsened in many places in recent decades. Updating the built heritage lists after the short span of a generation is politically controversial. There is a fear of built heritage inflation. In the meantime, the heritage buildings of the reconstruction period up to 1960 have been largely recorded, however, there is a backlog when it comes to the systematic inspection and assessment of the years 1970 to 1990.

And time presses, or better said: it is the owners with their comprehensive plans, not least for energy modernisations, market adaptations, redensification or replacement buildings, who are urging for action.

The Baukultur awareness necessary to make carefully considered decisions is deemed to be hardly developed in Germany. There is a lack of language ability and judiciousness when it comes to describing the spaces that surround and influence us. However, both are fundamentals necessary to participate actively in planning and design processes in the immediate living environment. It is therefore necessary to strengthen perception, judgement and communication skills from a young age. Baukultur education must convey the ecological, economic and if nothing else, the cultural value of existing buildings. This especially also applies to the less valued post-war buildings, so that they do not have to prematurely give way to new buildings or reconstructions. For example, the Landesinitiative Baukultur Nordrhein-Westfalen (State Baukultur Initiative North Rhine-Westphalia) focussed on the Baukultur of Conversion in 2014, through publications, events and projects.

Unrecognised Values The consequences of climate change and the urgent need to limit damage have been discussed for decades. Until now, the focus has been on industry, road and air traffic, agriculture, the heating, cooling and light supply of buildings and not least, plastic bags and coffee to go. The fact that the whole construction sector bears far more responsibility has hardly been the

subject of discussion. Only slowly are we becoming aware that careful handling of existing buildings can make an important contribution to mitigating the situation.

Until now, the building stock has been evaluated critically – mainly under the aspect of energy efficiency in operation. Compared to highly insulated new buildings with extensive technical installations, it is always at a disadvantage in this respect.

However, if building is considered in its entirety, the environmental performance of existing buildings is definitely positive. What is already there does not have to be quarried, produced and transported over long distances first with high energy expenditure. In the case of modern efficiency houses, the energy needed to erect them – the “grey energy” – accounts for more than half of the energy expenditure during their whole life cycle. However, above all, it is the environmentally harmful emissions that are produced during the erection, use and demolition of a structure that are relevant for climate protection. The Karlsruher Institut für Technologie (KIT, Karlsruhe Institute for Technology) and the Steinbeis Innovations Zentrum (siz energieplus – Steinbeis Innovation Centre) found that the construction of a three-storey multi dwelling building made of masonry and reinforced concrete accounts for the generation of 800 to 900 kilograms of CO₂. According to the United Nations, the construction sector is responsible for 47 % of the global energy-related CO₂ emissions. By also considering the emissions produced by construction projects, but which are otherwise attributed to the mobility, industry and energy sectors, a research team headed by Werner Sobek traced back more than half the greenhouse gases released worldwide to the construction industry.

At the same time, no other branch of industry has such a high raw material consumption as the construction industry. In Germany, 517 million tonnes or 90 % of the mineral raw materials mined domestically are used in buildings. In addition to new designation of settlement and traffic land, more than four hectares of landscape are stripped daily to obtain these raw materials. If these figures are related to the existing buildings, it can be seen that they contain an immense treasure of raw materials – at least until they are demolished. Moreover, the construction industry is also responsible for around 55 % of the net waste produced in Germany. Mineral building rubble now only accounts for half the waste volume. Substantial quantities of construction waste cannot be reused, but can only be placed in landfill, because composite materials can neither be recycled nor disposed of.

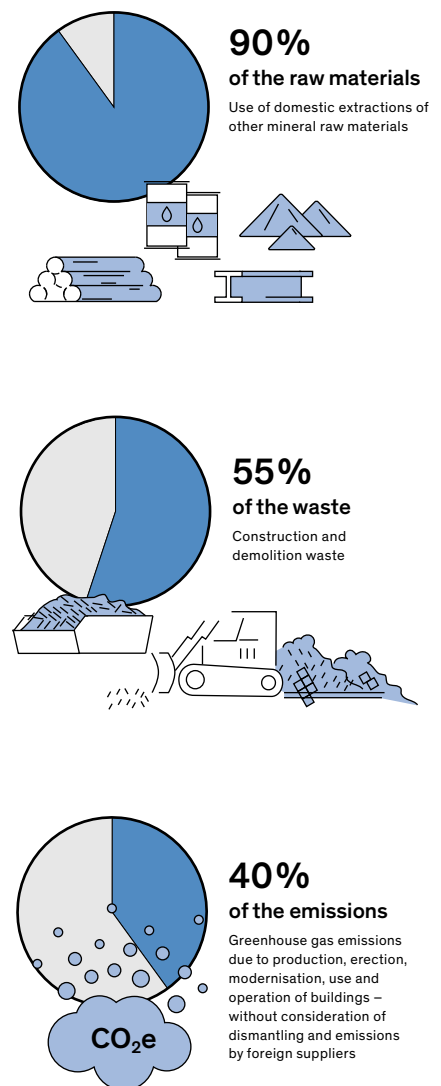
If the annual construction waste produced on building and demolition sites is considered (not including broken out roads and excavated soil), in absolute terms, the amount equates to the material required to build more than 422,000 apartments. Notwithstanding this, according to the Statistisches Bundesamt (Destatis, Federal Statistics Office of Germany), around 8,400 buildings were demolished in Germany in 2020. Only part of the actual demolitions are recorded, since in Germany, buildings of a certain type or up to a certain size are exempted from the need for a removal notice. The estimated number of unknown cases is therefore probably significantly higher.

And extensive building continues. 137,245 new buildings were erected in 2020 alone. Most of them, namely 97,510, were detached and semi-detached houses. Each day, 54 hectares of land are used for settlement and traffic areas.

The construction and building sector in Germany

Shares of raw material consumption, quantity of waste and greenhouse gas emissions

Sources: BBSR 2020; dena 2021; Destatis 2022



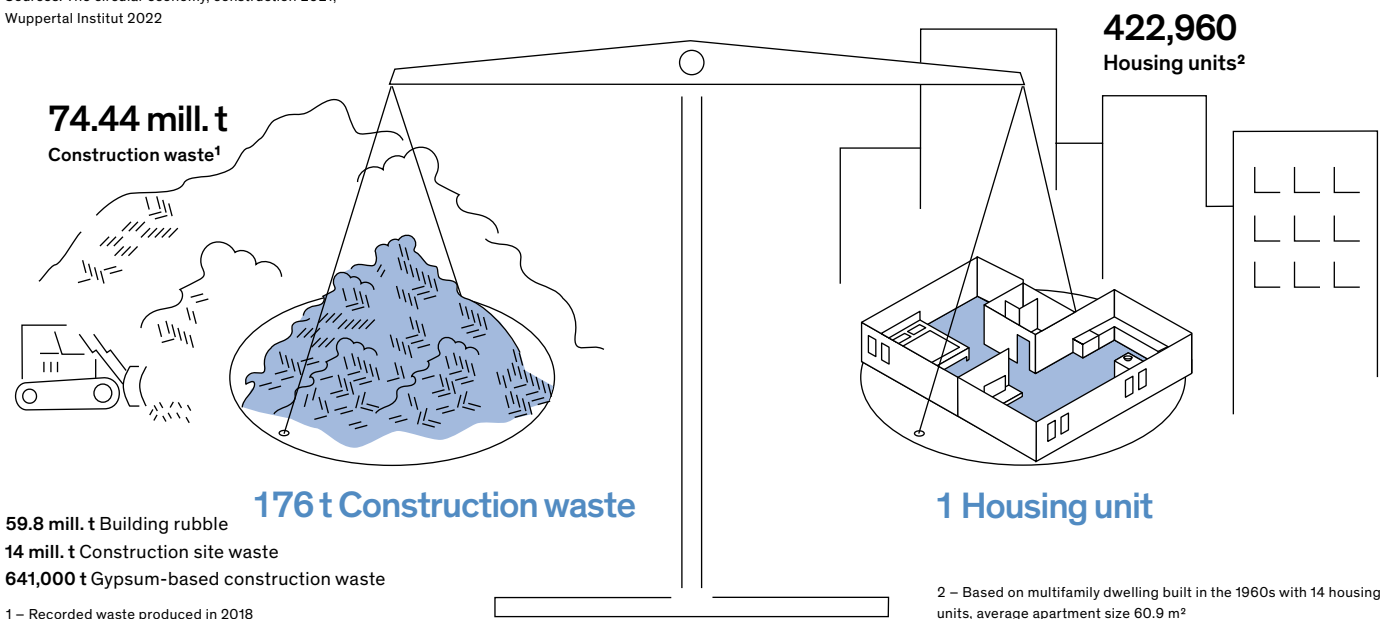
Even though building land is becoming scarcer, however, many people in Germany still dream of a detached house. In February 2022, the off-site construction industry proposed replacing empty old buildings in town centres with efficiency houses of the highest standards. The Bundesverband Deutscher Fertigbau (BDF, Federal Association of German Off-Site Construction) proposed a demolition bonus for old buildings whose renovation was not economically tenable. In this way, the locations could be made attractive for families and stop land consumption on the edge of town.

However, the position of the Association of German Architects (BDA), according to which the building sector will have to increasingly make do without new build in the future, has been supported by numerous surveys on resource and land use.

Assessors from the Steinbeis Innovations Zentrum and the Karlsruher Institut für Technologie made it clear that new buildings are required, but that with the “materials available today and without a structured circular economy, even as timber construction, they cannot make any positive contribution to the climate protection targets”. This message has not yet reached everywhere in the building industry. New build to the latest energy standards is often integrated in business figures in which fast write-downs and maximising profits play the main role. Many municipalities would like to express their future-orientation with new build projects or by “freeing up” municipal plots and using the sale of them to bolster the town's funds. For example, the conversion and repurposing plan, drawn up by the architects von Gerkan, Marg und Partner (gmp) for the listed Hamburg City-Hof of 1958, lost out to a competitor's new build project in a bidding procedure for economic reasons. The striking high-rise ensemble was demolished in 2019. By 2023, a building block with hotel, offices and high-price apartments will have been built in its place.

Germany's annual construction waste is equal to the calculated material requirement for approx. 422,000 housing units

Sources: The circular economy, construction 2021; Wuppertal Institut 2022



Existing buildings contain far more than grey energy and grey emissions: In times of upheaval, a new Baukultur of Conversion can provide continuity. It retains what is typical of the local area and contributes to the diversity and complexity of the neighbourhoods. However, it does not offer turnkey products, but instead demands imagination, initiative and creative skills from all who plan, design and build.

Each location and each building has its own history, which is interwoven with the biographies of the people who have lived, worked, learnt, loved, played and celebrated there. A high-quality Baukultur of Conversion passes on these biographies and histories and enriches them with new ones. The building itself often has specifics originating from its time that provide fresh impetus for an appealing design language. The Federal Foundation of Baukultur calls this added cultural, social, atmospheric, emotional added value of the development of the existing building “golden energy” (see *Introduction* chapter).

Lack of Care The basis of sustainability is care of the existing. In today's consumer society, however, maintenance and repair are neglected. In its recommendation, *Sustainable and sufficient building in the cities*, the German Association of German Cities and Towns came to the conclusion that: “Structural maintenance, however, measured by its importance, receives comparatively little public and political attention. It has now become the rule that in most cities, at most a quarter to a third of the maintenance funds required for the structural infrastructure are actually provided.” The erstwhile live-in caretaker who knew a building and its installations inside and out, is long since a thing of the past. Remote maintenance and surface cleaning have taken the place of daily monitoring and targeted and on-time intervention. Increasing wear leads to loss of fabric, which in turn causes the renovation costs to rise further. Many cities and municipalities have also been heavily in debt for many years, so that even acute repairs were omitted. The municipal panel 2021 of the Kreditanstalt für Wiederaufbau (KfW, German national development bank) estimates that the investment backlog in German municipalities is €149 billion. Where there is a lack of money, the idea of a sale is obvious. Otherwise the property remains unused, decays and sooner or later is demolished. Such processes mar the attractiveness of a community. Even if sold, demolition is not excluded – mostly contingent on a simple profitability calculation, which ignores the topic of grey energy.

A concept and calculation model has been established in the construction and property industry that attributes a certain life to buildings. A commercial building is written off after 30 years, it reaches its economic life after 40 to 60 years and its nominal end of life after 100 years at the latest. It is often de facto still in good order.

The same applies to bridges: Riveted railway bridges, for example, are often in service for more than 100 years. Their fatigue strength and the capacity to also carry higher traffic loads can be verified by measurement. Repairs are possible. Even 40-year-old, highly trafficked prestressed concrete motorway bridges can be cost-effectively modernised and retained for future higher road loads, as examples in Switzerland show. In Germany, different bases of assessment and risk assessments tend to lead to demolition and new build to the latest standards. These new bridge structures are generally more massive due to additional escape and maintenance routes and are frequently designed

The majority are in favour of competitions for particular engineering structures

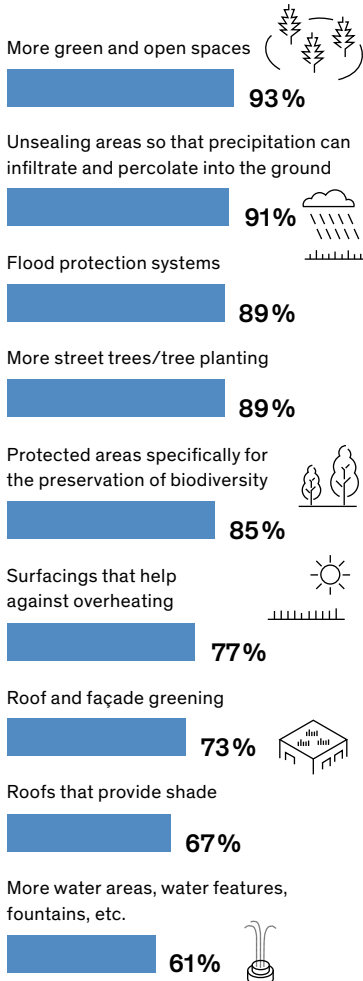
According to 64 % of the population, design competitions should be held for particular engineering structures before their construction. A further 15 % call for this for all engineering structures, such as bridges.

P14c

High approval of the population for climate adaptation measures

Source: Population survey for the Baukultur Report 2022/23

Climate change adaptation measures that are important to the population:



according to purely functional and economic criteria. In contrast, many older bridges are impressive structures that dominate the landscape and are often masterpieces of engineering history as well. This makes their unnecessary or premature demolition a Baukultur loss.

Adapting to Changing Conditions

The Challenge of the Climate Change Transition There is no longer any denying that we must convert our landscapes and cities to make them climate resilient: Germany is now also experiencing repeated unusually hot summers with droughts and forest fires and then back to flooding and increasing storms.

Many areas of land are sealed, many streams are piped. Small shrubs that protect against the wind have been removed so that soil erosion advances. Monocultures grow in the forests and on the fields. Heavy equipment increasingly compacts the arable soil. Stream and riverbanks are built on, there is a lack of floodplains. Many cities have expanded into important fresh air corridors. Land consumption continues to be high. Settlements have been built on once natural slopes. In the cities there is a lack of open spaces on which rain can infiltrate and percolate. There is a lack of water areas and trees that provide cooling. The tasks that climate adaptation sets us are extensive and multifaceted and the population's awareness of their necessity is high – as the population survey impressively shows. These tasks can only be solved with foresight and an interdisciplinary approach and, above all, cannot only be considered from the ecological perspective. A Baukultur of Conversion is needed, which continuously optimises the performance and quality of public spaces.

The pressure to act to reduce greenhouse gas emissions is equally high. It is the only way to achieve the 1.5 degree goal agreed at the UN Climate Conference in Paris in 2015. At the end of 2019, the European Commission launched the “European Green Deal” and on 14 October 2020 it announced the “A Renovation Wave for Europe” initiative to ensure that construction also makes its expected contribution. As the subtitle says, it is a matter of “greening our buildings, creating jobs and improving lives”. A specific target is to significantly improve the energy efficiency of 35 million buildings in Europe by 2030. On 15 December 2021, the European Commission presented the draft for the necessary revision of the “Energy Performance of Buildings Directive” (EPBD). Among other things, it includes a renovation obligation for the “worst-performing buildings”. These are the 15 % of buildings that perform worst with regard to operation-related emissions. Public and non-residential buildings should achieve energy performance rating E at least within the next five years. Residential buildings must have at least an F in their energy performance certificate by 2030. However, the classification system must be established Europe-wide first. There is also a real worry that many buildings will not achieve these standards and a demolition wave will therefore ensue. The quantities of waste, some problematic, which could then be produced, and the resource consumption for replacement buildings, would be downright counterproductive with regard to environmental and climate protection.

In Germany, the draft “Gebäudeeffizienzenerlass des Bundes” (Federal government building efficiency directive) in 2021 gave rise to criticism among experts

and in the media, because it also does not provide for an integrated consideration of the building and neighbourhood solutions, but instead one-sidedly deals with the insulation values of the building envelope and the final energy consumption. Once enacted, the “demolition directive” (as named by the Association of German Architects) would be binding for all public buildings.

Loss of Functions and New Standards Our society is changing rapidly. Many buildings lose the function for which they were designed. What was once taken for granted is no longer the case – belonging to a church parish, for instance. According to the *Bonn Generalanzeiger* newspaper, a total of 453 churches in North Rhine-Westphalia were deconsecrated from 2000 to 2018. Dwindling parishioners means that a new purpose must be found for outstanding urban architectures, which once marked the social centre of the districts and settlements. The churches of both denominations most notably part with younger buildings. Conversion for other uses is a challenge both socially and architecturally and was discussed in the Baukultur Report 2018/19. According to the population survey conducted at the time, there is basic acceptance of the repurposing of church buildings. Cultural uses such as concerts, exhibitions or even libraries lead the way, trade and commerce receive hardly any approval as reuse options. The new purpose can only be developed seriously based on the needs of the neighbourhood and the individual structural conditions. There are already very many good examples – Baukultur Rhine-Westphalia provides implementation examples, information and contacts on its project website, *ZukunftKirchenRäume* (Future church spaces). However, if the Baukultur value of churches is unrecognised, demolition and new build are obvious.

The city centre is also undergoing change: Department stores are becoming increasingly empty in the Internet age. Banks are reducing their network of branches. The pedestrian zones characterised by chain stores have long since lost their attractiveness. Vacant business premises occur in medium-sized cities and lead to a downward economic spiral in the whole area. The pandemic has increased this trend. Based on a survey of municipalities with more than 5,000 inhabitants, in its *Zukunftsfeste Innenstädte* (Future-proof city centres) study, the imakomm Akademie estimates that the vacancy rate of shops will be permanently 14 to 15% and even higher in B and C locations. Retail businesses and even catering outlets will withdraw.

Pop-up stores and other interim uses can counteract the downward spiral initially but are not a permanent solution. This can only be achieved by converting the city and town centres into mixed use locations. Which role the concrete frame buildings of the large department stores can play would have to be examined on a case-by-case basis. In most, the ceiling height and floor loads are sufficient to accommodate a large number of different urban functions. With a little imagination, they could also be converted into apartments, provided the large room depths can be broken up and light can be guided into the building. Green inner courtyards could contribute to living quality.

Multistorey car parks are losing their purpose in city centres that are increasingly “car reduced”. Most of the massive buildings are deemed off-putting and ugly. If a complex has to be demolished for structural reasons, the opportunity arises to stimulate fresh new urban planning ideas. Initial conversion projects such as the Gröninger Hof in Hamburg, however, show that the

Change of the city centre

44% of the cities surveyed state that retail properties in their city centre are (very) frequently affected by vacancy or vacancy is already apparent. [M5](#)

supposed “non-places” can also be developed and converted into vibrant, inner-city neighbourhoods – for urgently needed affordable apartments. The mobility transition could also pave the way for reactivating over-dimensioned road spaces and car parks for public life and at the same time make the city more climate resilient.

It is not yet foreseeable whether and how working from home will continue to develop after the pandemic. If an increasing number of office floors become vacant, they could also be used to create new city apartments. The Arbeitsgemeinschaft für zeitgemäßes Bauen (ARGE eV Working Group for Contemporary Building) estimates that around 50 % of the office buildings in Germany could be repurposed or converted into apartments with easy to moderate effort.

Repurposing will be a recurring and primary task in construction. To this end, perspectives must be developed with regard to how we want to live together in the cities in the future. There are no panaceas. Every municipality must assess, discuss and actively tackle their own situation in situ.

Not only repurposing but also continued use poses challenges for planners and designers: Ownership structures change, as do work processes. New tasks are added. New technologies need to be accommodated. Expectations of the building infrastructure also increase and change. New safety and hygiene standards are given priority. Staff, use figures and footfalls change. Inaccessibility or accessibility are serious concerns. Workplace standards change, as do the representation wishes of company management. Only a few of these factors are enough to question an existing building.

Medicine and engineering, for example, are developing so fast that a hospital building can ostensibly only keep up with them for 25 to 30 years. The decision about the future of the large Großhadern university hospital in Munich, which was erected from 1967 to 1977, was made on the basis of a feasibility study, which examined three options: renovation while keeping the hospital open, partial new build with renovation of the existing buildings or complete demolition after new build. At the end, the Free State of Bavaria and the university hospital opted for the new build solution. Concerns about a building site lasting 20 years while the hospital remained open were too great. The existing large structure is to be demolished, although it could easily be made usable for apartments in Munich.

The renovation of the listed building of the university hospital in Steglitz, now the heart of the Benjamin Franklin Campus of the Charité hospital in Berlin, shows how it can also be done differently. 115,000 cubic metres of concrete and 8,700 tonnes of steel were used to build Germany’s first large hospital that was officially opened in 1968. It has gradually been modernised, section by section, for several years. In addition to technical and functional adaptations to the operation of a contemporary hospital, in the case of the iconic university hospital in Aachen, the general renovation by Architektur- und Ingenieurbüro Wörner und Partner brought more light and air into the modular megastructure of the 1980s and thus improved the atmosphere significantly. If it is really no longer possible to adapt to present day hospital operation, repurposing the large buildings should at least be examined first before demolishing them.

The post-war theatre buildings are also facing substantial pressure with regard to use and change. Just how difficult it is to integrate additional acting spaces, state-of-the-art stage technology and building services and current fire protection measures in a listed opera house is shown by the longstanding building site of the

“Stages of the City of Cologne”. In contrast, Düsseldorf’s city council opted for new build. The requirements and wishes for the opera house were too extensive. The decision on the new location still has to be made.

Concert and theatre buildings continue to be cultural flagships of the municipalities. They compete both for the big names among the artists and for attention in culture tourism. They are meant to be beacons of the city, and discussion of the costs of new build or renovation quickly reaches billions. Function and representation expectations of today’s artistic and business directorships should face up to a justifying debate. Not everything that is theoretically achievable is necessary in reality.

Preferred Form of Housing Detached house developments of the West German economic wonder and boom years have hardly come up in the discussion of the Baukultur of Conversion to date. The focus is on the town and city centres whose revitalisation is funded with numerous urban planning programmes. But demographic change also makes itself felt on the edges of the municipalities. Where a family of five once lived is now home to a widow. The children have long since left home, live elsewhere, may possibly have built their own home. Several of the houses, which have hardly been modernised in recent years, are already empty, because there is no one outside the metropolitan regions who wants to buy them. In this way, whole streets can become desolate. An early study titled *Veränderung der Wohnungsnachfrage und Reaktion des Wohnungsangebots in Nordrhein-Westfalen bis 2025 (Changing housing demand and response to the housing offer in North Rhine-Westphalia up to 2025)* forecast that by 2025, every fifth detached house in the West German state will be empty. As vacant properties in this area are not recorded systematically, however, it is not possible to report on the current situation.

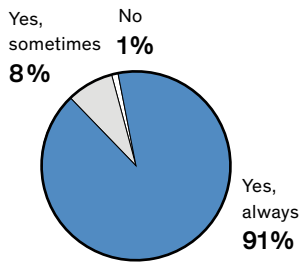
Of 19 million residential buildings in Germany, 16 million are detached houses. Statistically, only 1.79 people live in each. Thereby, the existing stock has space for a further 32 million occupants, as the architecture professor Wilfried Wang calculated in the paper *Nachhaltigkeit trotz Kulturideale oder: Der entscheidende Kampf um das Einfamilienhaus (Sustainability despite cultural ideals or: The decisive fight for the detached house)*. Yet most people who dream of a detached house – and according to the *Interhyp Wohnraumstudie 2021 (Interhyp dream housing study)*, that is supposed to be almost two thirds of all tenants – think of a new build. Of course, it should be energy efficient and as generously sized as possible. Although rising prices for building land, building materials and services have recently awakened interest in the topic of tiny houses, demand for living space continues to grow. In 1965, one person occupied 22 square metres on average. In 2020 it was 47.4 square metres, more than twice as much. If the dream of owning a house soon also includes a well-insulated home office, the aspirations may well also continue to grow. Most have a double garage as well, which often occupies more space than a small house on a development site of the post-war period.

If the trend of recent years were to continue, by 2030 a further 90,000 detached houses would be added yearly, which together would require 489 square kilometres of new settlement land. That is equivalent to the city areas of Dortmund plus Stuttgart. Warning voices have long since been getting louder, urging that the houses being built in new development areas now are the vacant

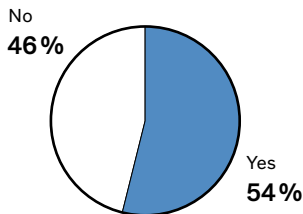
Demolition despite checking

Source: Municipal survey for the Baukultur Report 2022/23

Does your city check whether conversion is possible when developing municipal buildings?



Have municipal building stocks been demolished in your city in favour of a replacement new building during the past ten years?



Quality assurance, particularly through design competitions ...

78 % of the cities surveyed and 37 % of the surveyed rural municipalities have used instruments for the quality assurance of construction projects in the past five years. These were first and foremost design competitions. [M30](#)

... but not always for conversion projects

36 % of the cities that have used instruments for the quality assurance of construction projects in the past five years have not used them for conversion projects. [M31](#)

properties of the future – and at a high price: The development of only one plot costs the municipalities 30,000 euros on average.

Steering the interest of parties wanting to build towards the existing building stock is an important step. While there are catalogues and show houses for new build, there are no such visual aids for conversion. In this case, the municipalities must become creative and take the initiative in order to remove the fears of those wishing to build and point out prospects to them.

Several municipalities have already led the way with good example: Some make use of their right of first refusal, others purchase and develop abandoned houses, set up show apartments, fund building surveys or provide grants – for example, in the “Jung kauft Alt” (young buys old) programme in the North Rhine-Westphalia municipality of Hiddenhausen (see *Create Incentives* chapter).

Structural Obstacles

Dealing with the Unknown Wherever the future is invoked and progress promised, new build has a glowing reputation. Not only the names of renowned architects, but also diverse environmental certificates, from bronze to platinum, can enhance a property investment. The requirements profile for a new build and its room allocation can be developed within a certain cost framework. The building, planning and design processes are well-practised and digitalised. Standards form a tight corset. All participants feel secure. The ground-breaking, topping out and key handover ceremonies are festive occasions, which accompany a new build project.

Anyone who converts is faced with a different reality: Little seems certain in the existing building. Initially it is a large unknown. The existing building rarely corresponds to the building plans of long ago – if they have been provided at all. Smaller and larger renovations have taken place since the first occupancy. The building and its parts have aged differently. Perhaps the building fabric was even poor from the outset. Building rubble and slag were commonly used as building materials in post-war buildings. Shortage of material and poor workmanship also characterise the prefabricated concrete slab buildings erected in the final years of the GDR. The industrialisation of buildings has brought about a large number of new building systems, building elements and synthetic building materials since the 1960s. Therefore, before each design, it is necessary to check what specifically is involved. What impact do the materials have on the ageing behaviour, building physics and building biology of the building? Are there contaminants? If yes: Which? How should they be assessed? Can they be removed? And how? Structural engineers must check for signs of fatigue and assess whether the old structure can support additional loads. Essentially, the basic question is what the old building is capable of: What new functions result from its location and its structure and which are out of the question? Ultimately there is also the question of retention capability, however, it can never be answered in advance or on a “one size fits all” basis – for example, due to the construction period, or over-cautious assumptions or ostensible marketing interests.

This explains why, after examining the existing building, preference is nonetheless frequently still given to demolition and subsequent new build.

Fear of the unforeseen, an associated longer construction period and rising costs that can no longer be estimated are widespread, particularly in conversions, although new build also has a “contingency” category. As building also has a legal side, an existence-threatening question always looms large: Who is liable? Building engineers and architects are assigned an enormously high responsibility, which not all are prepared to accept.

Building in existing fabric requires a completely different design culture than new build. Architects and engineers are still primarily taught to build new buildings and structures. But if they apply new build methods and techniques to the existing building they hastily come to results that make dismantling seem unavoidable. “Measure instead of calculating” is therefore urged by Eugen Brühwiler, Professor for Structural Maintenance and Safety at the ETH Lausanne university. The bridge construction specialist whose methods of measurement for verifying the resistance and fatigue safety of structures have contributed to the resource-efficient retention of motorway and railway bridges, which would have been condemned to demolition and new build with the usual “recalculations”.

Anyone who wants to convert must be fully aware and well-informed about the structure. As with built heritage conservation, construction research or an (in-depth) building survey in Phase Zero should be the basis for a project development. The scope and depth of the survey depend on the complexity of the property. Such a survey helps to minimise risks and prepares for decisions regarding the type and extent of interventions. In the teaching of planning and design professions, however, appropriate curricula and work placements have played a secondary role to date. Experienced professionals in construction research who could pass on their knowledge are now rare.

The possibilities that the building offers should always be examined, instead of forcing prepared room allocations and use programmes on it. Such a procedure requires focus on solutions and open and unbiased curiosity on the part of the planning authorities, those wanting to build and the architects involved. The existing planning and design routines, however, leave little room for this. The familiar competition formats or calls for tender are rarely geared to creative openness.

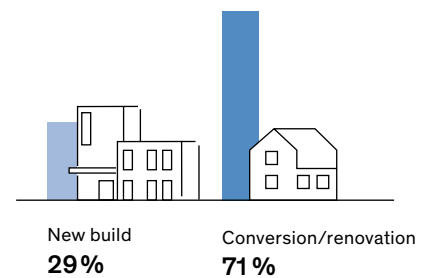
Competitions are also a suitable instrument for securing Baukultur quality for conversion measures. In this context, the public sector needs to align its contract award procedures to conversion and sustainably convertible construction methods. Unlike the specifications for health and environmental compatibility or the obligation to develop an energy and sustainability concept, recyclability requirements have rarely been set to date. The municipal survey shows that the administrations only rarely demand a life cycle cost analysis.

The severe shortage of skilled workers in the trades is a hindrance. In 2017, the Bundesarbeitsministerium (BMAS, Federal Ministry of Labour and Social Affairs), already assumed that by 2030, there would be a shortfall of almost 800,000 workers. The number of master craftspersons could fall by around 30%. But the skilled trades have a significantly higher share of the work in conversion projects than in new build. With new build it is mostly a case of implementing the cost-effective system solutions offered by the industry by following the instructions. Conversion on the other hand requires skills and knowledge, which must be trained. Traditional production and repair methods are missing in the business management oriented curricula. The training therefore ought to be more strongly geared to Baukultur. That could make the jobs more interesting.

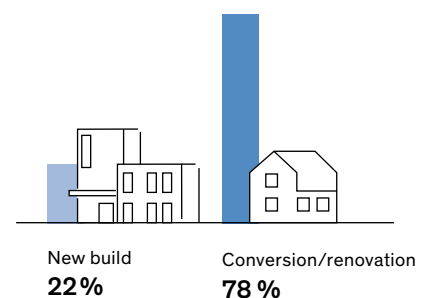
Skilled trades find conversion good

Source: Survey of the trades for the Baukultur Report 2022/23

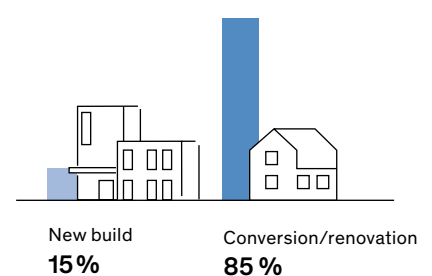
What percentage of your turnover do you achieve in which area?



On which construction site do you prefer to work?



Which area will be more important for your company in the next ten years?



Conversion before new build

A large majority of the planners and designers surveyed consider the call for new build projects to only be allowed as the ultimate ratio and to build in the existing fabric instead to be right (34%) or partially right (55%). However, almost half (44%) state that they can never or only rarely implement this standard in professional practice. [PD3](#) + [PD4](#)

Sustainability in municipal calls for tender

Source: Municipal survey for the Baukultur Report 2022/23

To what extent are sustainability requirements integrated in calls for tender in your municipality?

Health and environmental compatibility requirements for construction materials

37 % 63 %

Development of an energy and sustainability concept

36 % 64 %

Requirements for homogeneous separability of construction materials

25 % 75 %

Requirements for the recyclability of construction products

23 % 77 %

Certification of sustainability

17 % 83 %

Preparation of a life cycle cost analysis

11 % 89 %

■ (Very) often ■ Rarely or never

New-Build Oriented Regulations The building laws were created at a time when they primarily concerned new build. The building codes are also focussed on new build. A building code legal basis directed at conversion is lacking in all the German federal states. The Bundesarchitektenkammer (BAK, Federal Chamber of German Architects) and the Federal Foundation of Baukultur started discussing a new conversion building code several years ago.

The grandfather clause protecting existing buildings against new regulations can also make conversion more attractive in certain cases, for example, if the existing building is higher than allowed in the local development plan. If a change in use is planned or if the structural interventions exceed a certain degree, however, an official approval becomes necessary. It is then possible that the grandfather clause may no longer apply. The building regulations and standards that are mandatory for new build then apply, such as for acoustics, ceiling heights or ceiling deflections. Above all, far reaching fire protection regulations, which are enforced for responsibility reasons without the option of considering equally safe alternatives, can make a conversion project considerably more difficult or even prevent it. If the grandfather clause is removed due to conversion plans with a change in use, the current provisions for setbacks, separation distances and parking spaces also apply. These are requirements that frequently cannot be met without endangering the project as such.

Following the current building regulations causes additional work in the existing building, leads to loss of fabric and causes high costs. After considering economic aspects, the decision is then frequently made to demolish and erect a new building – whereby, with the exception of listed buildings and buildings near listed buildings or monuments, demolition does not generally require a permit and in some cases does not even require notification.

Even under the German Building Energy Act, the current new build standard of the respective reference building is decisive as soon as only 10 % of an external element area is changed architecturally. A small measure thus becomes a large one, which can over-challenge the existing building technically, devalue it qualitatively and impair it aesthetically.

If the planned conversion concerns a heritage building or a house in a built heritage ensemble, the measure requires a permit under built heritage protection law. As much as built heritage protection must ensure that the fabric of the features relevant for the historic importance of a building is retained, it is this same concern that equally opens up discretionary powers regarding the application of the usual building regulations. In relation to the Building Energy Act, Section 105 provides for an exemption for heritage buildings as well as for buildings with building fabric particularly worth protecting. These privileging facts for existing buildings that are particularly worth retaining can be provided by the relevant administration. Without these exceptions, the Baukultur value of regional housing landscapes and urban neighbourhoods could not be retained.

Conversion has received too little funding to date. Unlike built heritage protection, there is no attractive tax write-off option for investments that benefit a Baukultur of Conversion that retains existing buildings. A law implementing the climate protection programme 2030 in taxation law has existed since 2019, but it does not allow for grey energy: The tax-supported renovation measures for owner-occupied properties only include thermal insulation measures, the renewal of windows, doors and heating systems. Through the introduction of a “Nachhaltig-

keitsklasse" (NH, sustainability class), the "Bundesförderung für effiziente Gebäude" (BEG, Federal funding for efficient buildings) redrafted in July 2021, takes into account the entire life cycle of a building in ecological, socio-cultural and economic respects for the first time. Apart from the energy use, the greenhouse gas emissions, "which are produced by the building, including the production phase and upstream supply chains" are also taken into consideration. This has been criticised, for example, by the Zentraler Immobilien Ausschuss (ZIA, German Property Federation), which demands that the BEG be switched "consistently to CO₂ reduction".

Profitability Valuation Framework It is not only higher construction, planning and design costs compared to new build and insufficient grant options that can lead to demolition, financial aspects can also play a role. The Immobilienwertermittlungsordnung (Property Valuation Ordinance) applies a varying total use period for different types of buildings. A building loses value continuously until it is zero. But if the value of the land plot on which the building stands increases annually by 10 % and more in booming cities, it can seal the fate of the building at the latest when it is sold – especially if the city, under certain preconditions such as additional public use on the site, enables higher plot use (coverage, number of storeys) than before. Funds and property companies view property purely as an investment. This requires the creation of easily marketable areas and the land value must be exploited to the maximum possible degree. For several years, this approach has been used in the banking metropolis Frankfurt am Main to replace fully functional but older high-rise buildings with new higher ones. Land and planned value growths are the fundamental business model here.

Until now, economic aspects have always played the main role when it comes to weighing up retention and development of an existing building against the new build option, whereas it already makes a difference that the two alternatives frequently have to be paid for out of different budgets. One example is Deutsche Bahn: Until now, the company had to finance bridge remediation as maintenance costs, a new build is largely paid for out of the federal budget under the Leistungs- und Finanzierungsvereinbarung (LuFV, performance and funding agreement). For this reason, the over 100-year-old Beckerbrücke viaduct in Chemnitz was due to be demolished and replaced by a new bridge. A citizens' initiative, supported by expert reports, persuaded the Eisenbahn-Bundesamt (EBA, Federal Railway Authority) to retain the steel truss bridge with its impressive architectural and engineering design.

Expert reports are necessary and are used as preparation for the decision-making made by weighing up safeguarding the existing structure against new build. In some cases, however, the reports tend to reflect the expectations of those who commissioned them. Cost estimates are variable. For example, the "Initiative Zukunft Städtische Bühnen Frankfurt" (Initiative for the future of the "Städtische Bühnen" theatre and opera building in Frankfurt), which campaigned for retention of the cultural building, complained that the investment costs for the new build option favoured by the city were downplayed and sustainability aspects were made to seem better than they were. Even if a new build results in lower construction costs, it is not automatically also the better solution in economic terms. There are voices that urgently demand a CO₂ measure in construction, with which the grey emissions of demolition would also be attributed to each new build project. This could initiate an objective rethink that pays more attention to conversion potential.



Baukultur of Conversion

The Focus Topics

Germany is faced with diverse conversion tasks: The range extends from sustained conversion of our cities and landscapes to issues dealing with the existing building stock through to the necessary adaptation of construction methods and processes suitable for the future. The focus topics: “Conversion of City and Land”, “Building and Infrastructure” and “Conversion – Rethinking” describe trendsetting solutions. It is not only successfully dealing with technical, economic and ecological challenges that count. Rather, we need a new conversion culture. It leads to upgrading of the existing building stock, to changes in new build and ultimately to a higher design quality.

Conversion of City and Land

Our living spaces in the city and on the land change with our needs – continuously, and that has always been the case. Coping with the climate crisis is a particular challenge of our time and will require far reaching adaptations. New demands on housing, working and living, mobility and consumption will also have to be met. It is necessary to unite different disciplines and standards so that the conversion of our living spaces leads to a good functional and design result. In doing so, we must use the opportunity to discover *Baukultur* qualities in the existing, to strengthen them and to implement the conversion as part of measures that were due anyway.

Adaptation for Climate Change and Transition

Landscapes Shaped by Humans Only 3 % of the worldwide land area is deemed to still be ecologically intact. The rest is shaped by humans and is therefore a design task. This also applies to agriculture and supposedly natural landscapes. Farmland takes up more than half of Germany and often provides monotonous scenery due to land consolidations (see *Orderly Landscapes* chapter) and a design geared solely to yield maximisation. It also includes rivers and streams that in the past have often been squeezed into a narrow bed, piped, straightened and built on.

Climate change causes longer dry periods and more frequent storms, heavy rain and flood events. It makes it necessary to adapt farming and landscape, which should be accompanied by a design improvement. Dividing up land and fields with trees and hedges, for example, counteracts wind erosion and at the same time leads to a more multifaceted landscape scenery. The Deutscher Verein des Gas- und Wasserfaches (DVGW, German gas and water industry association) has forecast that by 2100, the quantity of water available could decrease by 30 to 60 %. Rehabilitating dams, developing them and building new ones is indispensable for drought periods and flood events and can be not only a functional, but also a construction design task, which can give rise to unusual solutions: In a design study, the Viennese architect firm Delugan Meissl proposed integrating a photovoltaic system and hotel rooms in the Tirolean Zillergründl Dam. The highest dam in Germany, the Rappbode Dam, has just received an award from the German Federal Chamber of Engineers as a historical symbol of the art of engineering.

The renaturation of water bodies is an important step for natural flood precautions. Between 1995 and 2015, 4,500 hectares of water meadow land were recovered as flood areas, and since 2017, the federal government's "Blaues Band Deutschland" (Blue Belt Germany) programme has funded the renaturation of waterways and their meadows. That not only improves flood protection and living conditions for animals and plants, it also benefits the landscape scenery.

Sealed Surfaces The soil fauna in sealed soils dies. Sealed soils are also lost as carbon stores. In Germany, soil captures more CO₂ than the forests! Sealing also prevents precipitation from infiltrating and percolating through ground and thus prevents cooling evaporation as well as sufficient groundwater recharge.

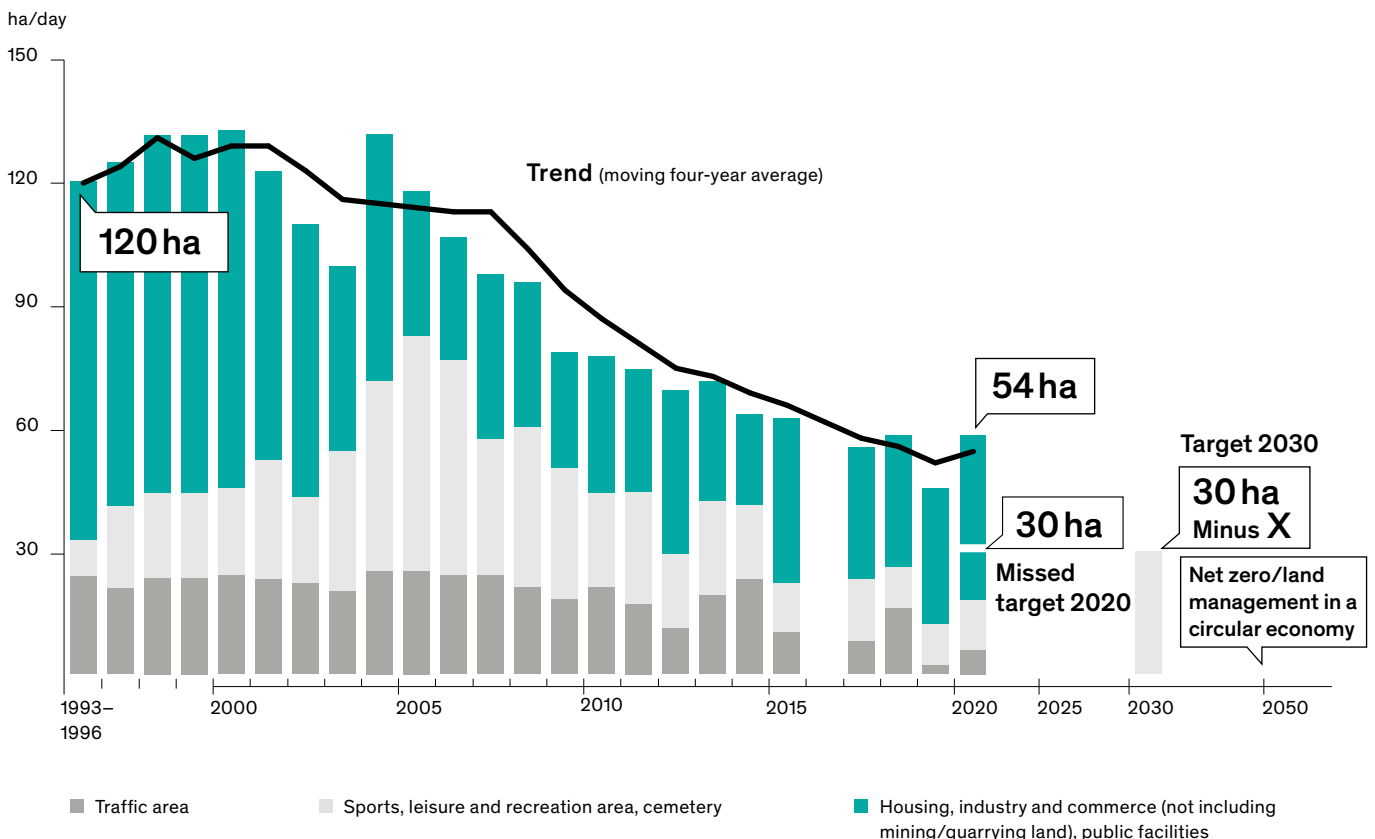
Sealing is nonetheless progressing, even if slower than before: Whereas in 1992, 5.3 % of Germany’s land was sealed, in 2018 the figure was 6.5 %. The increase is related to the increase in settlement and traffic areas, of which almost half (45.1%) are sealed. Each day, 54 hectares of forest and agricultural land are redesignated. The goal, to limit planning land use to 30 hectares by 2020, was therefore missed by a wide margin. It is now to be achieved by 2030 and the net land use according to the national climate protection plan should reduce to zero by 2050. New land areas may then only be used for settlements and traffic facilities to the extent that they are cleared elsewhere.

The Bundesinstitut für Bau-, Stadt- und Raumforschung (BBSR, Federal Institute for Research on Building, Urban Affairs and Spatial Development) points out that the demand for housing space can be satisfied without designating further building land. According to the study on “*Bauland- und Innenentwicklungspotenziale in deutschen Städten und Gemeinden*” (building land and inner development potential in German cities and municipalities), there are at least 99,000 hectares of land ready for building as well as land reserves, two thirds of which are earmarked for housing uses. 85 % of this land is wasteland and infill sites, i.e. inner development potential. In addition, there are building land reserves

The goals are still far away

Daily growth and composition of the settlement and traffic area

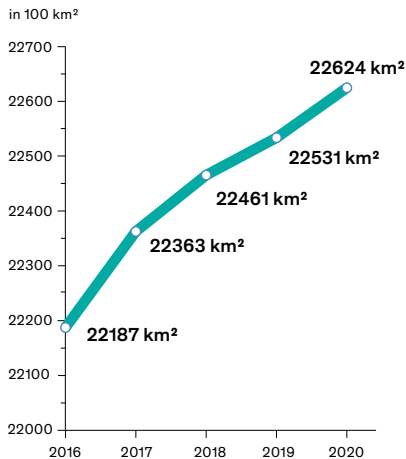
Sources: Destatis 2021; UBA 2022



Soil sealing continues to increase

Rise in the sealed land areas in Germany

Source: Statistics offices of the federal government and the federal states



Each year, an area roughly the size of Sylt Island is sealed.

with already secured development. Space for 900,000 to two million apartments is therefore available, without having to use additional land areas. With denser building, as many as four million apartments would be possible. Finally, an additional, long-term building land potential of 34,000 hectares are represented in land utilisation plans in the form of greenfield sites without secured development or “land set aside for building”.

The capping of land use by tradeable certificates was also trialled in a pilot project. The municipalities received a limited number of certificates, which they had to use to designate building land in the outer area. For larger projects, the municipalities had to acquire certificates from other municipalities. Although the test was successful, no policy action has been initiated yet to achieve the implementation necessary by 2050.

In 2020, 89 % of the redesignated land areas were designated as settlement land and 62 % of that was for housing. This clearly shows that doing without new settlement areas is the most effective lever against land use. Activating the potential of already developed areas is also more advantageous, because it saves development costs, avoids traffic and reduces the already described doughnut effect (see *Public Services* chapter). This is where the Baukultur of Conversion comes in and helps to curb land consumption through clever and creative brown-field development.

Designing the Energy Transition The energy transition and its influence on our cultural landscapes were discussed in detail in the Baukultur Report 2016/17.

According to the Umweltbundesamt (UBA, German Environment Agency), in 2020, wind power supplied 23.7% of the electricity produced in Germany; photovoltaic systems contributed 9.9%. In the long term, these energy sources will likely win out over electricity and heat generation from biomass and biofuels, because they need less space.

Photovoltaics is also increasingly being installed on open land, yet it is mainly the growing number and size of wind turbines that continues to ignite discussions: At over 200 metres high, new turbines are often taller than most high-rise buildings in Germany. Their number has more than tripled in 20 years: In 2009, there were 9,359 wind turbines turning on the German mainland; in the summer of 2021, they already numbered 29,715. In addition to which there are 1,501 turbines off the coast.

However, this development has slowed since 2018 due to the lack of land areas. According to a 2019 study by the German Environment Agency, 3,131 square kilometres, less than one percent of the federal territory, is designated for the construction of wind turbines. The main hindrance is the specified distance from housing developments. A federal law is therefore planned, which specifies what share of their land space the federal states must provide for wind power development.

In this discussion, it is easily forgotten that new turbines are also a design task. The topography is mostly only considered for functional reasons. Yet skilful location selection and development from a design point of view could safeguard the view of valuable landscapes and therefore also increase the acceptance of wind power. A Landschaftsbild & Energiewende (Landscape Scenery & Energy Transition) study commissioned by the Bundesamt für Naturschutz (BFN, German Federal Agency for Nature Conservation) should provide assistance. In Bavaria,

where only six turbines were approved in 2021, so-called “Windkümmerer” (wind troubleshooters) are deployed to moderate the often controversial location discussions.

Disputes about the course of the energy routes, which are to transport the electricity from the wind farms in the north to southern Germany are no less forceful. It is not only the sight of the overhead cables that many people dislike. If planned inadequately, the “electricity motorways” also have consequences for the ecosystems that they cut across. However, comprehensively laying the cables underground would cause substantial additional costs. The dilemma can be easily remedied by laying and integrating the routes along highways and motorways, railway lines and other infrastructures.

Design aspects also come into play with regard to coping with the energy transition in the inner cities. Decentralised energy supply approaches are becoming increasingly more important. Rising to the challenges at the neighbourhood level allows precise fitting of integrated concepts, which could hardly be realised for an entire city. Likewise, measures in the neighbourhood are often more efficient than in an individual building. This makes neighbourhood energy concepts a central factor for the success of urban development strategies. After municipal heating planning has been pursued for decades, for example in Denmark, the topic is now increasingly being considered in Germany too. An overview is provided by the *Kurzgutachten Kommunale Wärmeplanung* (Short municipal heating planning report), which the Deutsche Institut für Urbanistik (Difu, German Institute of Urban Affairs) prepared for the German Environment Agency.

Funding formats such as the KfW’s “Energetische Stadtsanierung” (urban energy redevelopment) programme already focus on the level between buildings and city. It benefits projects that link the energy transition and urban renewal. Grants are also given for conversions made necessary by the demographic change or for climate adaptations in which green and water areas are created in the neighbourhood.

Considering whole neighbourhoods also makes it easier to safeguard building fabric and Baukultur values. Instead of completely cladding the Gartenstadt Margarethenhöhe settlement in Essen with thermal insulation, a concept was developed for its energy-efficient renovation, which networks the households and therefore takes into account the value of the built heritage site (as Germany’s first garden city).

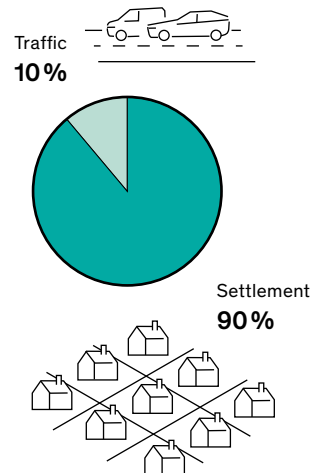
A study by the Hamburg housing company SAGA and the housing cooperative HANSA entitled *Quartierssanierung versus Gebäudeoptimierung* (neighbourhood measures versus building optimisation) suggests that the provisions of the Hamburg climate plan (which provides for climate neutrality by 2050) can be met more efficiently from the neighbourhood perspective. Where the energy-efficient renovation of old buildings does not make good financial or design sense, their shortcomings can be compensated for on balance by neighbouring buildings that are better in energy terms and by ensuring a climate-friendly heat supply. That saves costs and safeguards architectural qualities.

Life in the Cities The microclimate in the cities suffers from the high degree of surface sealing: The air is dryer and the average temperatures are above those of the surrounding region. The fact that climate change and the ensuing rising temperatures require extensive adaptation measures was already described in

Settlement areas dominate land use

Shares of new settlement and traffic areas designated in 2020

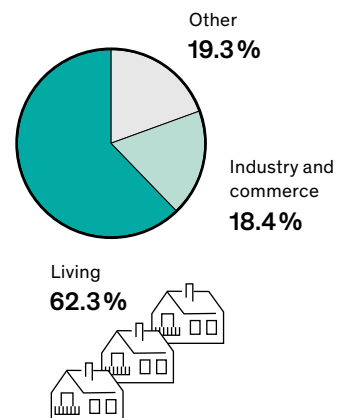
Source: Destatis 2021



New settlement areas mainly for housing use

Shares of the new settlement areas designated in 2020

Source: Destatis 2021, 2020



Baukultur Improves the City Climate

Holstenfleet Kiel – Water Areas Instead of Traffic



Where 12,000 cars a day once crossed the pedestrian zone on four lanes and buses stopped every minute is now used to stroll, play and pass the time away. Instead of the harsh street canyon between Kiel's old city and the suburb in the south, two water basins with attractive, largely accessible banks have been created. Benches and seating steps covered with the robust wood of the Nordic pine as well as man-made peninsulas invite people to relax by the water on the sunny side of the old city. Young lime trees and pin oaks line the banks and provide shade. A reed belt keeps the water clean and cools the air. In amorphous plant islands, whose edges also provide an opportunity to sit, grasses and blue vervain sway in the wind. A non-place has become an inner-city oasis, which even attracts people in the evenings after the shops have closed.

Kiel's citizens have christened this 170-metre-long water area in the city, developed by the bgmr landscape architects, "Holstenfleet". The man-made body of water brings to mind that until the 19th century, a waterway between Kiel Fjord,

the boat harbour and the Kleiner Kiel inland water had made the old city a peninsula. The last part of the canal was filled in 1904. After World War II, Kiel was rebuilt as a traffic-oriented and functional city and was given one of the first pedestrian zones in West Germany. An ambitious revitalisation programme for the city proper has been in progress for years. There are now apartments, new hotels and catering outlets there again. With the Holstenfleet, the city has taken a decisive step towards the traffic transition and at the same time has significantly improved the climate in the city: in both the concrete and figurative sense.

The driving force for the blue-green infrastructure measures was the city's public works department. Because the six-lane "Holstenbrücke" road was in need of rehabilitation, it was worthwhile thinking about traffic-calmed alternatives. It was not easy. The individual traffic had to be completely rerouted, the bus stops relocated. The lane for local public transport was relocated to the suburb side. There the whole area is created as a kerb-free, wheelchair-friendly *shared space*.

The striped pattern of the blockwork paved pedestrian areas corresponds to the similarly designed asphalt surface of the bus lane designed with epoxy resin-bonded fine grit. Light coloured blockwork stripes casually mark the pavement, along which 800 buses a day still run – at walking pace. Due to the overarching design, the whole area from the boat harbour to the Kleiner Kiel appears to be a city square.

The name Holstenfleet (Holsten Canal) belies the fact that the new body of water rests in concrete basins, which required elaborate foundations with 16-metre-deep bored piles. The water is 1.50 metres deep, there are paddling areas, which are only 40 centimetres deep alongside the water area. The water is pumped out of the Kleiner Kiel, prefiltered and then circulated through planted soil filters. It therefore remains continuously clean.

An intensive participation process, managed by the Hamburg firm Luchterhandt, made sure that today the citizens identify themselves with the disputed project. They were able to attach their wishes on slips of paper to a six-metre-long future model in the middle of the city. There were workshops and planning walks. A total of 670 contributions were received. Among other things, possibilities to play on and in the water were requested. A number of these were then also implemented by the designers under the landscape architect Dirk Christiansen. Two additional bridges for pedestrian and bicycle traffic were designed by the Sauerzapfe Architekten firm. With the Holstenfleet, life has returned to the centre of the city. The water area is a popular meeting point and has received multiple awards in the meantime. Businesspeople have invested in its surroundings, modernised and rebuilt their buildings.

Facts

<p>Design and construction: 2012–2020 Size: 17,000 m² Developer: State Capital Kiel (Public Works Department) Designers: bgmr Landschaftsarchitekten, Berlin; ifb – Frohloff Staffa Kühl Ecker Beratende Ingenieure, Berlin; Ingenieurbüro Obermeyer, Potsdam;</p>	<p>Masuch + Olbrisch Ingenieurgesellschaft für das Bauwesen, Oststeinbek; Sauerzapfe Architekten, Berlin Cost: €18.5 million</p> <p>More information in the project description in the appendix on p. 120</p>
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- BAUKULTUR AT A GLANCE**
- Redesign of the public space vitalises the city centre
 - Motorised traffic gives way to recreational quality
 - Reference to the historical city space
 - Improvement of the microclimate
 - Intensive civic participation

Protection of biodiversity can be linked to Baukultur concerns

Source: Municipal survey for the Baukultur Report 2022/23

To protect biodiversity, the surveyed municipalities opt for ...

Provision of areas for creating meadow orchards, urban wilderness, etc.



Renaturation of stream/river courses



Unsealing measures



Retreat areas and food sources for animals in urban open spaces



Promotion of green roofs



Other*



* Other, including wildflower meadows, tree planting, counteracting sealing

Green and biological diversity in the cities

Almost one third of the cities surveyed (29 %) do not have any planning concepts or strategies for developing the urban green spaces. An equal number (28 %) state that they have no concepts for protecting biodiversity. [M8](#) + [M9](#)

Development of water areas

43 % of the population would like more water areas to improve the appearance of their city or their location. Yet only 15 % of the municipalities surveyed state that developing water areas is a current planning and building objective. [P3](#) + [M1](#)

detail in the Baukultur Report 2020/21 on *Public Spaces*. According to the current population survey conducted on behalf of the Federal Foundation of Baukultur, nine out of ten people would like more green and outdoor spaces and trees. Over 60 % want more water areas, fountains and similar. However, it is not enough to just consider the aspirations of people. The city also provides a home for wild animals, and conservation of biodiversity is a social task of urban redevelopment, which is still all too seldom taken care of.

So-called “animal-aided design” takes into account which species and groups (such as songbirds or wild bees) we attribute high importance to and includes their needs in the planning.

Concern for the animal world does not have to be contradictory to the needs of humans. In a survey by the German Institute of Urban Affairs, three quarters of those surveyed declared the integration of diverse habitats in built-up urban areas – an urban wilderness – to be desirable.

Cities are therefore well-advised to develop long-term strategies for the retention and expansion of the green and blue infrastructure. As the municipal survey shows, many cities and municipalities already opt to rewild rivers and streams and to provide open spaces as part of well-thought-out conversion.

23 hectares of agricultural land was transformed into a park for the Ingolstadt state horticultural show and was therefore secured as a permanent fresh air corridor. Where only small leftover plots are available, pocket parks can be used to upgrade the surroundings. Their trees capture CO₂ and filter pollutants out of the air. Because they provide shade and cool by evaporating water, they also reduce the heat island effect. New and existing green must adapt to changing conditions: The Bund Deutscher Landschaftsarchitekten (Federal Association of German Landscape Architects) pointed out how important it is to opt for “future trees”, which can withstand the changing temperatures of the coming decades, when selecting the species.

Elsewhere, bodies of water are cleared or recreated to link climate adaptation to the creation of attractive urban spaces. Examples include the Holstenfleet in Kiel and the Elstermühlgraben ditch in Leipzig. Yet even small ponds, fountains and water features can improve the microclimate.

Retention of biodiversity is also an urgent task. Instead of monotonous areas of asphalt or grass, creating a meadow with perennial borders and bodies of water leads to a higher quality open space for humans and animals. For ecological as well as for design reasons, qualified open space plans should be required as part of the planning application – even for detached houses.

The fact that many buildings have been planted in recent years is not least thanks to municipal funding. Sun protection through shade and the evaporative cooling of greening (transpiration) can reduce the temperature in the building by up to ten degrees according to the ARUP consultancy firm. Green roofs can relieve the sewers because, depending on the type of construction, they can temporarily store up to 90 % of the rainwater and therefore cushion runoff peaks. According to the Bundesverband GebäudeGrün (BuGG, Federal Association of Building Greening), 90,000 square metres of green façades and 7.2 million square metres of green roofs were created in 2019. This roof area, however, equals only 9 % of the flat roofs erected in the same year – which shows how large the development potential is. Ideally, the greening is combined with an additional benefit, for example, roof gardens with recreational quality.

Furthermore, our technical water infrastructure is also facing a major conversion. Sewer and well systems mostly originate from the post-war period and are incorrectly dimensioned for current requirements. From today's point of view, decentralised rainwater management in conjunction with green and water management is recommended: the concept of the "sponge city". Instead of routing precipitation into the sewers and risking overloading of the system, it is collected in the soil, swales and on roofs. There the water infiltrates the surface and percolates or is stored temporarily in order to water the cooling vegetation in the next dry period. The concept has spread slowly to date. Several cities, however, have already developed ambitious sponge city strategies. In the north of Leipzig, a whole city neighbourhood will be created on a former railway site, based on these principles.

Technical flood protection must also be reinforced in many places. Through integrated planning, vital public places can be created: For the renewal of the River Weser bank reinforcement at Waller Sand in Bremen, the persons responsible opted to relocate the rock bank stabilisation further into the water, thus creating space for a sandy beach. And on the banks of the River Donau in Regensburg, following a Europe-wide competition, the flood protection was redesigned in an interdisciplinary cooperation process and attractive open spaces on the waterfront were acquired.

Conversion Task in Centres and on the Periphery

Building Better in the Centre Conversions can enhance city and village centres as a residential and business location. This seems all the more advisable as the urbanisation from 2005 to 2011 has reversed. The German Economic Institute (IW) mainly attributes the renewed inclination for the suburbs to a shortage of housing and increasing rents in the cities. Cultural preferences also play a role. According to the *Interhyp dream housing study 2021*, almost two thirds of those surveyed would like to live in a detached house – although settlement land consumption, infrastructure costs and climate consequences are arguments against this form of settlement.

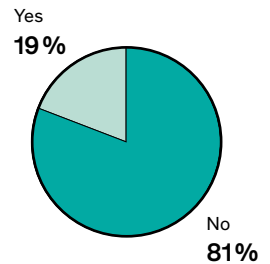
The move away from the city centre is not only accompanied by additional public expenditure (for example for infrastructure) and more intensive use of individual transport but also with significantly higher land consumption. The almost 40 % of the German population who live in small towns and rural municipalities already take up more than 80 % of the settlement and traffic area. Yet even shrinking municipalities are still designating new building areas on the edge of town – in the hope of retaining inhabitants or acquiring new ones. The risk of the doughnut effect occurring therefore grows and a further ring of new building areas forms around the desolate town centre and empty housing developments of the post-war period (see *Housing Wishes* chapter).

Many counterexamples in recent years have shown that the sprawl of peripheral settlements is not a natural law. Instead of becoming a ring doughnut, even smaller towns can become or remain filled doughnuts, which makes their well-filled centre attractive. Specific examples and recommendations for action for how municipalities can achieve this goal in six steps are provided by the *Besser*

Innovative rainwater management (harvesting) has not yet become generally accepted

Source: Municipal survey for the Baukultur Report 2022/23

Is the principle of the "sponge city" applied in your city?



... of which currently being planned: 39 %

Baukultur Vitalises Urban Communities

Gundelsheim – A Village Takes Shape Once More



In the past, Gundelsheim was readily derided as Bamberg's "bedroom". Now, however, the 4,000-inhabitant municipality receives national attention for its Baukultur development. Step by step, on its own initiative, the municipality filled vacant properties, assigned new tasks to old buildings, championed high-quality conversion and upgraded the public space. This is not only thanks to the commitment of the mayor, Bürgermeister Jonas Merzbacher, but also the participation of the citizens.

Gundelsheim's centre is the idyllic Leitenbach stream with its low-lying meadows. To the north of the stream is the old high street, on which the small Lukas Church and the old town hall, which was once a school, are located. A while ago, the municipality had a small area shaded by trees created in front of the church, whose seating steps reach up to the water. In the immediate vicinity of the old town hall are the two residential and shop buildings 7 and 9.

Number 7 is an impressive gable-topped house, built in 1900. It was once a "spice and bottled beer shop", later the

first food shop in the town. Since the Schlecker store closed in 2012, house 7 with its 1970s porch had been empty. In 2015, the municipality exercised its right of first refusal and purchased the building as well as the historical barn. Two years later it purchased the neighbouring house. A survey of the citizens in the meantime had resulted in a clear vote in favour of a restaurant. The town lacked an informal meeting place. With a 1:1 model made of pieces of scaffold and plans, the planned conversion was presented to all for discussion. As planning in Gundelsheim is always extensively social, five apartments for recognised refugees will also be created in the two houses at the same time. Syrian chef Karam Abazali, who already worked in the school kitchen, was ready to become the tenant for the catering. Today his "Spezerei" supplies the children's daycare centre, kindergartens, after-school centre, supplies various private recipients with delivered lunch to order, offers lunch and a menu in the evening, which include the obligatory schnitzel as well as Syrian specialities.

The architecture of the new municipal library on the south side of the Leitenbach stream had already caused a nationwide stir, having turned an old, formative building of the landscape, a long since abandoned farm, into the centre of the municipality's cultural life. The municipality took the initiative as an investor, after demolishing the barn, also wanted to demolish the 18th century house and the stable annex at the rear, in order to erect dense housing on the large property. Assisted by the Bavarian Chamber of Architects, the municipality held an invited competition, which was deliberately directed at six smaller and younger architectural firms in the region. Schlicht Lamprecht Architekten BDA in Schweinfurt restored the traditional "house – stable – barn" trio. The architects playfully and constructively developed a building-in-building concept from the existing building. The gutted old house surrounds the cabin-like children's library. The former stables stand under the protection of high barn architecture, which is attached to the library building. With this design, large rooms that can be freely laid out with mobile furniture, as well as reading rooms were created. The new library building, covered with wooden slats, appears as a simple rural form, and together with the old building forms a harmonious ensemble with an inviting forecourt.

The municipal library is long since more than just a place in which media are borrowed. The nursery in the gutted old house is used by the Wald Kindergarten on rainy days. Couples marry in the light-filled barn.

All projects in Gundelsheim, which were mainly financed with urban planning funds, are already integrating forges during their period of creation. The Gundelsheim residents' identification with their town grows from project to project. A new bridge over the Leitenbach is now being considered, to link the two banks and the municipal buildings and make them accessible by foot.

Facts

Design and construction: 2017–2020
 Size: 300 m²
 Developer: Municipality of Gundelsheim/
 Oberfranken
 Designers: Schlicht Lamprecht
 Architekten BDA, Schweinfurt; Tragraum
 Ingenieure, Bamberg; ecoplan Projekt,

Bamberg; Planungsbüro Pabst, Bamberg;
 BASIC, Gundelsheim
 Cost: €2.49 million
 More information in the project description
 in the appendix on p. 120



BAUKULTUR AT A GLANCE

- Creation of a meeting place in the centre of the village
- Multifunctional use concept
- Preservation of a formative building of the townscape
- Competition between young architect firms in the region
- Interaction of diverse measures to vitalise the town centre



Bauen in der Mitte (Building Better in the Centre) handbook published by the Federal Foundation of Baukultur.

Building consultations and design bylaws can help to safeguard the townscape and even to enhance it. Anchor places lend city and village centres an attractiveness that is lacking in the suburban developments. They can be a health centre, retail or a pub, as well as a club house, community centre or school. After standing empty for many years, Hof Prädikow farmyard, located to the northeast of Strausberg in Brandenburg, was purchased by the Stiftung trias foundation in 2016 and was let to a tenant cooperative and a society dedicated to education, culture and built heritage protection under a leasehold agreement. While 70 people now live and work on the estate, the former barn is used for cultural events and also for catering purposes. Rooms can also be rented for seminars. A place has been created that not only serves as a village community but also for interacting with guests.

In particular, educational buildings and cultural facilities in a central location are highly desirable: In the population survey, 87% were in favour of adult education centres and 91% for libraries as central offers.

The Franconian town of Gundelsheim responded with several construction measures at the same time. The municipality renovated public spaces, extended the former municipal administration into the “Kulturrathaus” or cultural town hall and converted a vacant farmhouse into a library. Today it is a meeting place and a new centre of the community – just like the “Bürger-Gast-Haus” civic inn, recently built by converting two houses and their agricultural outhouses. High architectural quality is intended to ensure that despite the complex programme, an anchor place with recognition value is created.

Vibrant and Mixed City Centres One challenge for all centres is the loss of importance of stationary retail due to e-commerce (see *Loss of Functions and New Standards* chapter). Vacant shops devalue the location and allow city centres to become desolate. The population survey conducted on behalf of the Federal Foundation of Baukultur shows that more than three quarters of the people would like dilapidated buildings to be renovated and to see an end to vacant properties in their city centre. This is not surprising, neither is the fact that a high proportion, 71%, would like more diverse offers in the centres that have long been tailored to consumption only.

The upheaval can therefore become an opportunity to resettle varied life in town and village centres. Apartments, educational facilities and owner-run shops characterised the scene here, before rising rents displaced them into locations on the outskirts. If – as a majority of the population wishes – they now find space in the centre again, it can make the city centres more attractive and less susceptible to future crises. The existing building stock holds large potential for new uses that enrich the city centres. On the other hand, buildings that have lost their function can be activated by repurposing.

But the restructuring process is difficult and requires the willingness to cooperate on the part of private and municipal property owners. In 2020, the Bundesministerium des Innern, für Bau und Heimat (German Federal Ministry of the Interior, for Building and Community) therefore appointed a city centre advisory council. In its *city centre strategy*, the council advises that integrated solutions should be developed instead of individual components and points out

the need to involve all participants – business persons, the property industry, the urban public and a wide range of other stakeholders. In September 2020 and October 2021, the Federal Foundation of Baukultur, together with the German Association for Housing, Urban and Spatial Development, the German Retail Federation and urbanicom drafted recommendations and addressed them to politics and policymakers in the statements titled *Stop the decline of our city centres* and *How trade and town centres can survive the crisis*. The federal “Zukunftsfähige Innenstädte und Zentren” (Sustainable inner cities and centres) programme has now been set up and equipped to develop and implement innovative model projects in 238 municipalities.

There is a broad consensus to support private participants in this revitalisation with public aid: A vacant property register, for example, can point out vacancies and “vacant property coaches” can expedite the development of new use scenarios. In 2021, however, an important urban development instrument was taken away from the municipalities when the Bundesverwaltungsgericht (German Federal Administrative Court) declared the right of first refusal to be impermissible in its current form. In accordance with the Coalition Agreement, the governing parties are currently endeavouring to find a new regulation required for control of the urban development policy.

The concept of the “managed shopping street”, as is being applied in the Seestadt Aspern project in Vienna, could also benefit the revitalisation of the city centres. To prevent vacant properties, a public general tenant is deployed there, who provides a letting guarantee and ensures a balanced and attractive trade and commerce mix to strengthen the functional performance of the centre.

However, a lively mix can only replace the prevailing monofunctionality if the legal prerequisites for it are right. An important step is to update the Baunutzungsverordnung (BauNVO, German Federal Land Use Ordinance). Until now it has stipulated that centre zones should mainly be reserved for trade and “central facilities of the economy, the administration and culture”, housing is only allowed in exceptional cases. Many projects already demonstrate the opportunities that existing buildings hold for living in the city. The Lindenkarree in Gelsenkirchen-Buer, for example, shows that even large department stores can be converted into residential buildings.

The manufacturing industry may also soon return to the city centres. According to the German Confederation of Skilled Crafts, only one in ten skilled trade businesses has a city centre location. And yet, according to the population survey, 71% of the population would like more skilled trade businesses in central locations.

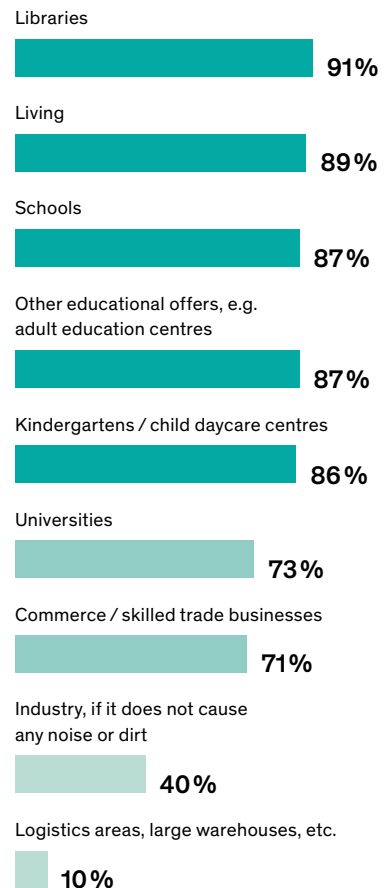
The reason for this is not only a new awakening enthusiasm for artisanal products. Repairing and adapting everyday objects is increasing in importance as reservations against the throw-away society grow – a field in which local service has an advantage over e-commerce.

Affordable rents, long-term prospects, which also include spatial expansion, and good infrastructure are the requirements for every business park. But principally, it seems necessary to revise the requirements of the Bundes-Immissionsschutzgesetz (German Federal Immission Control Act) which are set out in the Technische Anleitung zum Schutz gegen Lärm (TA Lärm, Technical Instructions on Noise). Many industries can now produce with far less noise than before (active noise control at the source). Significant advances have also been made in passive noise control in buildings.

Retail alone is no longer enough!

Source: Population survey for the Baukultur Report 2022/23

Additional offers wanted in the city centre:



Skilled trade businesses welcome in the city centre

71% of the population find it good if there skilled trade businesses and commercial enterprises in the city centre. **P4**

Discussions are currently in progress on equating night-time industrial noise to privileged traffic noise. That would be a further step towards better permissibility of mixing.

It remains to be seen whether the city centres can also be places for food production. Urban agriculture promises short and therefore resource-saving transport routes. At the same time, it allows consumers to follow the growing and rearing themselves. In 2020, the Rewe food store chain in Wiesbaden opened a supermarket in which herbs are grown, the fertiliser for which is supplied by the edible fish also reared on site.

In 2020, the university in Siegen opened a lecture theatre centre in the upper storey of a department store. The new facility is part of a campus that re-anchors the university in the city. By also using vacant rooms as display windows, educational, research and cultural facilities can present themselves in the city centre with little effort and cost. In Bochum, seven universities, some of which, like the Ruhr University, were created on the edge of the city during the post-war period, want to present themselves in the middle of the city starting in 2026. To this end, a post office building erected in the 1930s will be converted and will have an accessible green roof. A library and the adult education centre are also to be accommodated in the new “Haus des Wissens” (House of Knowledge), while a market hall will be established in a glass annex. More than nostalgia or preserving grey energy, the foremost thought is that familiar buildings endow identity and give new and multifaceted programmes an easily remembered face.

In the city centre with its diverse public uses can find space not only alongside each other but also successively. Because we view schools as protected space, this often leads to their exclusive use. As a consequence, the rooms are empty for many hours of the day. Not the case in Dettmannsdorf: In the small town near Rostock, after the lessons have finished, the school building provides space for community events, a children’s university and continued vocational training courses for regional businesses. In the summer holidays it is used as a youth hostel accommodation (see Baukultur Report 2020/21).

The roof terrace of the Salling department store in the Danish city of Aarhus shows that urban space can also be continued on roofs. However, such privately owned open spaces, which are not accessible to all, do not open up anywhere near the same possibilities as real public spaces. The idea of a “city roof walk” in Hanover is therefore interesting: Public gardens are to be built on several buildings connected by bridges in the city centre. In particular, city centres in which post-war modernity buildings with flat roofs dominate, lend themselves to such deliberations.

Development of business parks

The municipalities surveyed meet the development needs in business parks primarily with building development by means of urban land use planning (87%). The upgrading of the public spaces (28%) or active location management (20%) are far more rarely pursued strategies. [IM7](#)

Business parks have a less attractive effect

Almost half the population (48%) is of the opinion that business parks are not really a part of the city. Only 3% find that typical business parks look good. [P6](#)

Potential of the Suburbs and Urban Sprawl Just like the city and land, the zone between these two spheres also faces fundamental change. With their industrial areas, office parks, shopping centres and large settlements, the suburbs and urban sprawl areas are often characterised in urban planning terms by monofunctional clusters. Germany-wide, more than 620,000 hectares of commercial parks lie in these zones, which is equal to an area seven times the size of the State of Berlin. They do not meet the changing needs due to climate change. The spatial density and architectural quality of business parks and industrial areas are also generally low. Experts attribute the design deficits to the fact that local development plans do not stipulate any design requirements or are not

even prepared. Four out of five municipalities see a need for development of their business parks – mainly on the edge of the settlement.

Despite its attractive location, the business park to the north of the Oranienburg town centre suffered from underuse and vacant properties. The reasons were deficits in the infrastructure, distinctly heterogeneous building and a complex ownership structure. In a model project of the “Experimenteller Wohn- und Städtebau” (ExWoSt, Experimental Housing and Urban Planning) research programme, the area and its development were reclassified by a local development plan and an area management was set up. To activate potential, smaller areas were offered and the establishment of skilled trades and workshop units and a business incubator were discussed.

Development of the infrastructure, for example, green spaces and mobility offers, can also be useful. The “Grün statt Grau – Gewerbegebiete im Wandel” (Green instead of grey – changing business parks) research project therefore suggests redesigning the areas naturally. This makes their entrance areas more representative and creates more attractive places for work breaks at the same time.

In the Grünwinkel business park in Karlsruhe, the building regulation requirements for redensification were established, bicycle paths were created and access to Karlsruhe West urban rail station was developed.

Shopping facilities, startups, creative industry businesses, welfare facilities and even housing forms are increasingly expanding the range of uses in the business park. In a publication, the BBSR described this trend as a change from business park to a productive urban neighbourhood. New technologies for low emission and space-saving production, the growth in importance of services (tertiarisation) and the reconvergence of production and concept in Industry 4.0 lead to transformation.

Because traditional tradespeople fear being displaced, however, such a neighbourhood is not free from planning law and real conflicts. Strategic location development and compartmentalised urban development planning are needed. Planned value growths and increases in land values should be used to create livable spaces.

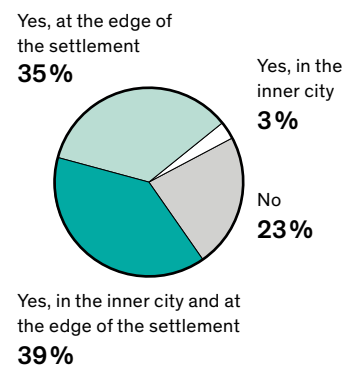
Elsewhere, efforts are underway to revitalise new office locations, such as those built from the 1960s. In Hamburg’s City Nord, for example, once designed as an office city, the former head office of the postal service (“Oberpostdirektion”) is mainly being replaced by apartments. The Brutalist building, which was demolished in 2017, could have become an identity-establishing landmark if it had been incorporated in the planning and design. However, a rethink is discernible, albeit slowly: The same project organisation is building on the adjacent plot starting in 2022 – and the upstream competition was won by the only firm, Sauerbruch Hutton, to integrate the existing building structure in its design.

Following the American model, in 1964, Germany’s first out-of-town shopping mall, the Main-Taunus Centre, opened as a greenfield development at the gates of Frankfurt. Innumerable other such centres, which targeted customers with cars, followed. Like the city centre shopping centres, with which they have competed since the 1990s, they are experiencing substantial pressure due to e-commerce. From 1995 to 2000, 100 new shopping centres were opened in Germany, but only 26 from 2015 to 2020, and only two in 2021. The Hamburg ECE Group, which manages around 200 shopping centres, has already realigned itself: Since

Four out of five municipalities see a need for development of business parks

Source: Municipal survey for the Baukultur Report 2022/23

Do the business parks in your municipality need development?



Baukultur Develops Difficult Terrain

MarinaMarina in Berlin – GDR “Plattenbau” Characterises New Creative Location on the River Spree



At the beginning was the discovery, improvisation and informal acquisition. The place now has a name: MarinaMarina is a collaborative project of Realace and SLOW in Berlin–Lichtenberg, which focuses on establishing a new creative neighbourhood along the River Spree. The intention is for the site to retain its wild, edgy charm that accounts for its special spirit.

The Klingenberg combined heat and power station dominates the scene. The lifeguard building and the listed boat-house are reminders that between 1927 and 1950 it was the home to Lichtenberg municipal river swimming pool, heated in the winter by the cooling water from the power station's turbines. Up to 17,000 bathers came daily to enjoy themselves on the beach. The site's history also includes that it was then the administrative headquarters of the GDR customs. A former three-storey “Plattenbau” (prefab concrete slab building) with a canteen, a large car park and numerous garages belonged to the property. If you turn your back on the power station and Plattenbau to wander through the

grass to the southwest bank, you feel far away from Berlin. Here the River Spree seems to be as wide as a lake. On the opposite bank there are wooded islands and parks. Much is feasible in this place – only housing is out of the question, being so close to the power station. It is a purely commercial property. From the outset, the 22,000 square metre site was planned to be transformed gently, step-by-step from the existing buildings while preserving the natural space. First of all, the garages were developed into art studios and workshops to plans by Thomas Baecker Bettina Kraus Architekten. The Spreestudios were created. Then came a small urban marina on the riverbank – a first project by PETERSENARCHITEKTEN.

The Plattenbau building of the GDR customs was accepted as part of the local history and was not demolished, but instead was converted and additional storeys added. The fabric was simply too good, explained the architect Ralf Petersen. A new building of the same size would have been far more expensive. Petersen only had the spandrel panels

removed and new glass fronts installed behind the highly profiled façade elements. The roof of the Plattenbau had such large load reserves that it was no problem to add two storeys to the building with a structural steel frame. Petersen was inspired by the boats lying bottom-up on the banks to design an unusual structure with steep roof slopes on all sides and a flat clay tile covering. Extensive use of varying combinations of window elements vitalise the roof façades. The rooms behind them have a bare, building shell atmosphere. The unusual arrangement of their windows ensure that users can enjoy the view anywhere – whether they settle on a low couch, sit at a desk or even stand at a standing desk. Every conceivable workplace is also optimally supplied with daylight. Instead of a slanted roof tip, the Plattenbau offers an all-round protected, large wooden deck with a fantastic panoramic view. The ground floor has naturally also been equipped with a sundeck facing the river. A few steps lead down into grassland.

Next door is the former flat-roofed building of the former customs canteen. Three storeys were added on the road side. Steel columns and beams form the industrial baseframe for the storeys of varying height. The topic of Plattenbau was deliberately addressed: PETERSENARCHITEKTEN used cellular concrete elements of varying dimensions for the façade, which results in an interesting relief. At the same time, the material has such good insulation values that it could be used monolithically. Shipping containers on the roof terrace provide additional storage space and contain a summer kitchen. At the same time, they shield the open space from future new building: the so-called “shipyard”, a type of conference centre.

The project shows how inspiring even prefab concrete slab buildings can be for an unmistakable, sustainable neighbourhood development, which continues the history of the site.

Facts

Design and construction: 2014–2018
Size: 5,500 m² (“Plattenbau”) / 1,200 m² (“canteen”)

Developer: Sendlinger Conrads / Axel Schukies
Designers: PETERSENARCHITEKTEN, Berlin; Ingenieurbüro Bauwesen Uwe Horn, Leipzig

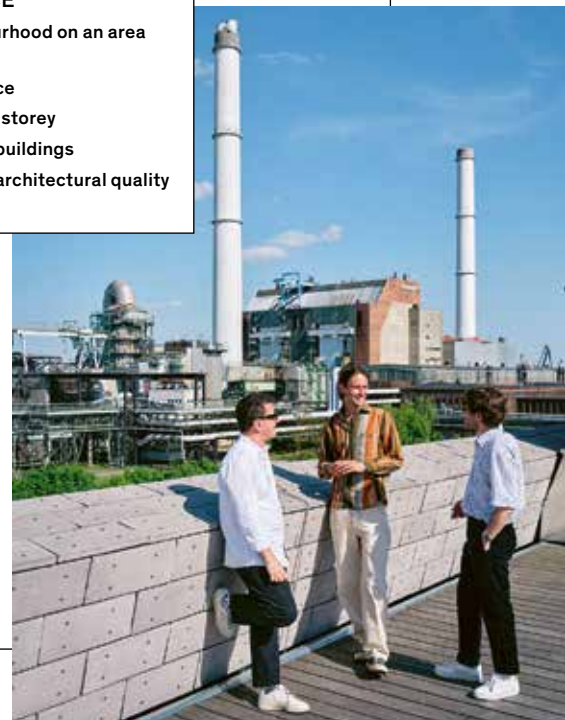
Cost: €6.5 million (“Plattenbau”) / €1.5 million (“canteen”)

More information in the project description in the appendix on p. 120



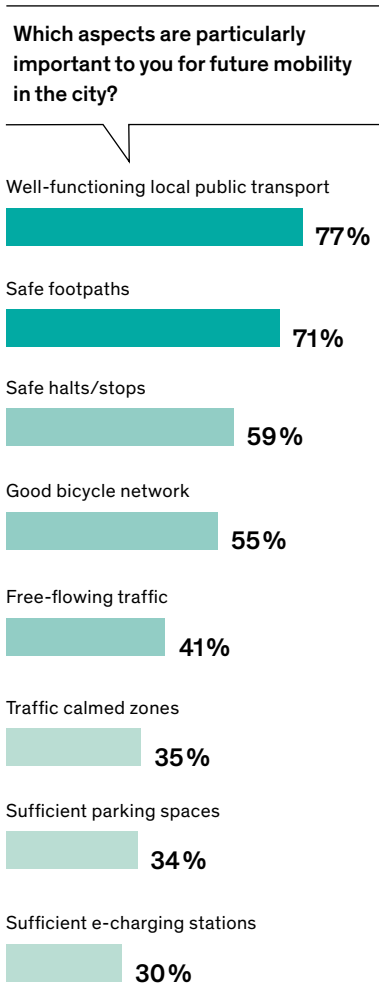
BAUKULTUR AT A GLANCE

- Innovative creative neighbourhood on an area with limited use
- Retention of the natural space
- Space gained by adding new storey
- Inclusion of GDR modernity buildings
- Conversion projects of high architectural quality characterise the location



Particularly important to the population: pedestrian traffic and local public transport

Source: Population survey for the Baukultur Report 2022/23



2020, the developer that previously specialised in shopping centres has viewed itself as a “broad-based real estate and investment group”. Many empty out-of-town shopping centres try to counter shrinking customer interest through new catering and entertainment offers. Whether that is sufficient seems questionable. The success of these conversion efforts is in any case just as unforeseeable as the future of the smaller local centres of local amenities, which were created on radial and bypass roads, in order to satisfy periodic demand for services, goods and above all food. Here the task of the urban redevelopment must be overcome through compartmentalised upgrade and new use concepts.

Large housing developments are a disputed legacy of the post-war period. A number have already been revitalised and partially dismantled. The densification, especially of post-war developments, is now planned to help solve the housing shortage. Berlin’s urban development plan, Housing 2030, which was adopted in 2019, for example, provides for the creation of around 200,000 new apartments in 30 settlements built after 1949 that are owned by the State of Berlin.

Hamburg has taken this path longer. For the IBA Hamburg (from 2006 to 2013), the Global Neighbourhood, a ribbon development of the state-owned SAGA that was built in the 1930s, was extended by adding two end buildings with 75 apartments, which closed the previously open courtyards. An argument in favour of redensification is that no new land areas are used and the capacity of existing infrastructure can be utilised cost-efficiently. However, this requires that this infrastructure has sufficient reserves. The ecological consequences must also be considered. Despite all the criticism, the residents continue to value light and air, the wide open spaces and the quiet of the urban peripheral location, which characterise many of these developments.

Care must also be taken to ensure that no meeting places are lost and the increased density does not lead to more stress due to noise or contamination. If the new buildings integrate previously lacking functions and the remaining open spaces are well designed, the development of a settlement can also be found to be positive. That is the task of a balanced Baukultur of Conversion.

Rethinking Mobility

Space Allocation Despite the carsharing debate, cars are apparently more in demand than ever before: In 2020, 48.2 million cars were registered in Germany – a record. Yet mobility is changing. Whereas in 2015, 70 % of Germans stated that they used a car regularly, in 2019 it was only 61 %. The changes in the modal split, i.e. in the allocation of passenger kilometres travelled to the transport types, also show the change. Even though the modal split differs depending on the number of inhabitants and density, it is clear that private transport is becoming less popular, while ecomobility (i.e. bus, rail, bicycle and footpaths) is gaining in popularity. This will have particularly severe consequences for the cities that were restructured during post-war reconstruction and in the 1960s and 1970s to be car friendly.

According to the population survey, only one third of the people now place importance on sufficient parking spaces, while the large majority demand development of local public transport. More than half the people surveyed wanted a good bicycle network. In the metropolises, 15 % of all distances are already

travelled by bicycle. In the discussions on redistribution of the traffic areas, the voices that call for development of the bicycle infrastructure are therefore among the loudest. At the same time, it is important not to measure the development of the bicycle network only in kilometres. For traffic safety and the cityscape, how functional junctions and crossings are designed, built and maintained is just as important.

Makeshift solutions such as warning posts or coloured markings should be replaced by a more differentiated design in the long-term. Lanes, for example, can be separated by planted areas.

One concern of clever local transport concepts is for passengers to have to make as few connections and changes as possible, the change from one means of transport to the other must then be easy and convenient to do. *Mobility hubs*, which are often at railway stations or other interchanges, have exactly this purpose. In Augsburg, the tramway lines have been lengthened and relocated so that they now meet together at the main railway station, which has also significantly accelerated changing to and from regional and mainline transport.

The Karlsruhe model on the other hand opts for fewer changes. Since the 1980s, the light rail system travels on standard gauge tramlines there in the city centre and urban rail routes in the surrounding region and uses a rail network of more than 660 kilometres. In this way, even small municipalities enjoyed a railway link. However, the direct connections to the city centre led to substantial congestion. Therefore, in a “combined solution”, the light railway on two routes was relocated and on a third the car traffic was relocated under the ground. The city acquired a solely pedestrian zone including a market square, a new green line from railway, bus and strolling as a result of the reorganisation – and in 2020, a top place in the “Bicycle climate test” of the Allgemeinen Deutschen Fahrrad-Club (ADFC, General German Bicycle Club). In its size category, Karlsruhe was voted 1st place, ahead of Münster. Karlsruhe is therefore following its mobility model, according to which traffic should preferably be avoided, otherwise relocated, and ultimately arranged compatibly.

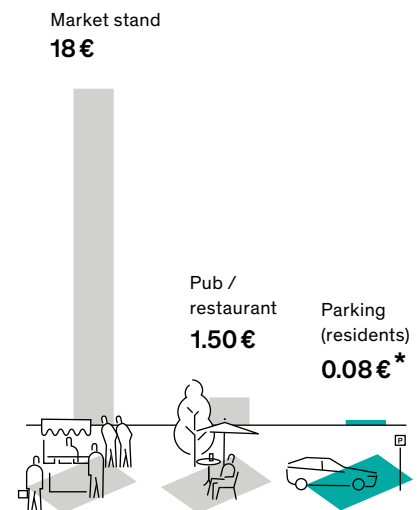
Public spaces are most highly impacted by parked cars. Often moved for only a few minutes a day, on average, each parked car clutters up twelve square metres and, due to increasing vehicle size and height, frequently also blocks the view of the surrounding area. Increasing displeasure about this private occupation of public areas may also be related to the comparatively low costs for parking vehicles on public land in Germany. Since the nationwide upper fee limit was abolished in 2020, however, many municipalities have increased the costs for resident parking permits. In Freiburg, for example, the fee is €360 per year for an average car.

In new build projects such as the Seestadt development in Mönchengladbach, neighbourhood garages are intended to relieve the street spaces and make the construction of expensive underground car parks unnecessary. The parking spaces in multistorey car parks can be reached from the apartment on foot and accessibly. Neighbourhood garages that are a *mobility hub* at the same time, i.e. dock onto local transport stations or sharing locations, are particularly advantageous. They should be designed now with sufficient clear height so that later, if they are no longer needed, conversion for second and third uses is facilitated. Here, like elsewhere, the conversion of traffic areas holds large potential for urban development.

Privileging of parking as a special use

Source: Agora traffic transition 2020

Fees for special uses on public roads per day and per area of a parking space using the example of the city of Munich.



*in Freiburg, at least 0.99 euros since 1 April 2022

Measures for parked vehicles

In relation to parked vehicles, municipalities most likely provide park-and-ride car parks (25%) and opt for active parking space management (24%). Only 8% of the surveyed cities and municipalities build public underground car parks. [M4](#)

Long-Distance Traffic Good design is frequently also lacking in long-distance overland traffic. Motorway services, such as the Dammer Berge bridge restaurant opened in 1969 above the A1 motorway, had a quality which is lacking in the standardised buildings of recent years, which are hardly possible to distinguish between as places. One of the rarer cases from recent times, in which a rest area was understood to be an architectural task at all, is the Leubinger Fürstenhügel motorway service area between Erfurt and Sangerhausen. For the IBA Thuringia project, the Deutsche Einheit Fernstraßenplanungs- und -bau (DEGES, German Unity Motorway Design and Construction Company) and the franchisee Shell Deutschland sought a design in an international and interdisciplinary competition, which fits into the landscape and historical context.

Since 1998, franchisees build and operate the restaurants and petrol stations on the larger service areas. New build and conversion of unmanaged areas, i.e. rest areas equipped with furniture and WCs only, are the responsibility of Autobahn GmbH. These areas also require improvements which extend beyond the renewal of the toilet facilities.

What is missing are in-house design teams on the client side, which can agree on design issues with architects. Reintroducing them would increase the structural quality of the facilities significantly.

Contrary to earlier attempts to aesthetically embed motorways in the landscape, today's efforts to enhance the design of the course of the road are mostly limited to the choice of noise barrier system. These walls, which rarely emanate from a real will to design, reinforce the separating effect of the road, because they isolate travellers from the environment in the same way as a length of cutting. Noise barriers made of mud were designed in an interdisciplinary art and research project for the widening of the A 14 motorway in the Prignitz district. The bunds erected from excavated material could protect against traffic noise in a visually attractive and landscape-specific way and, as nesting places for birds and insects, they would also be advantageous for biodiversity. The implementation has not yet been decided.

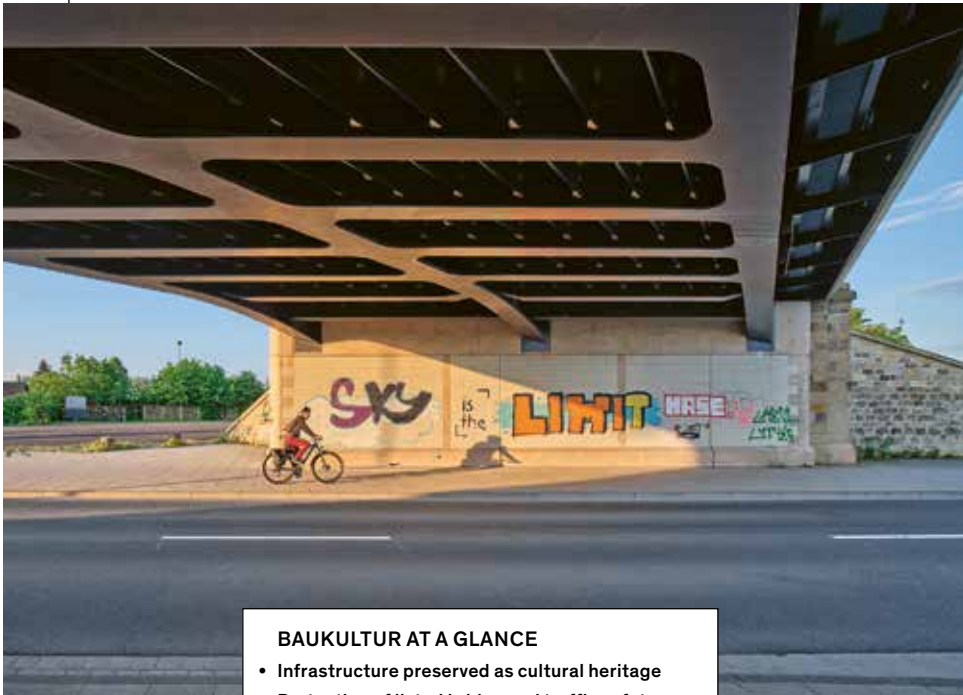
There is also a need for action by Deutsche Bahn (DB, German Railway Company). It operates 95 % of the 5,700 railway stations, stops and stopping points in Germany, yet it owns only around 700 of the 2,300 station buildings. In fact, in the summer of 2022, the Bahn announced that it would cease to sell station buildings from then on. But the separation of station and building will also result in future design and functional deficits through to vacant buildings. Instead of selling them and using them otherwise, where possible they should be re-established as a place of arrival and departure. Access to the track should lead through the station building and its importance and function should be designed accordingly.

While the main railway stations in many large cities are more like shopping centres, the bare necessities are lacking in smaller stops. In 88 % of the DB railway stations, passengers have no possibility of shopping for their journey. Yet according to the population survey, 85 % of the travellers would like shopping options such as a bakery or a newspaper shop. In addition, only 14 % of the active transport stations have public WCs for travellers.

The investment backlog of the railway is high. In 2021, the federal government and DB invested a total of €1.6 billion on the renovation and conversion of railway platforms and station buildings alone. On the one hand, this is due to the age of

Baukultur Retains Public Transport Connections

Lange-Feld-Straße Railway Bridge in Hanover – Reconciling Built Heritage Protection and Traffic Safety



BAUKULTUR AT A GLANCE

- Infrastructure preserved as cultural heritage
- Protection of listed bridge and traffic safety balanced out
- Complex innovative construction
- Model for many other rail facilities



There were times when the railways erected landmark examples of the art of engineering. Every bridge was designed architecturally – including in Hanover, where the goods railway was built around 1900. Impressive ashlar walls and pedestals decorate the bridgeheads and influence the urban spaces to this day. Yet after more than 100 years of operation, the riveted steel bridges display the usual damage. In absolute terms, they are no longer a match for the forecast traffic loads. Standardised replacement new structures, mostly made of concrete, not only change the cityscape. Their massive structure heights also frequently make expensive road construction work necessary. Both – the change in the historical appearance and the lowering of the road level – were rejected by the authorities of the City of Hanover in the case of the Lange-Feld-Straße bridge, which is protected as an individual listed structure.

The engineering consultancy firm, Ingenieurbüro Marx Krontal Partner, reconciled the operating requirements of the railway company and the built heritage protection concerns with an integral design. The technical conditions were challenging: The tracks of the bridge run at an oblique angle across the highly trafficked Lange-Feld-Straße road. But Deutsche Bahn demanded perpendicular, torsionally stiff joints.

Marx Krontal Partner therefore developed a steel half-through frame, whose shape is based on the old bridge structure. Its three haunched girders are tied directly into the newly built abutments. This also made it possible to do without maintenance-intensive anti-uplift bearings. The overall height of the steel structure is the same as the historical structure. There are no intermediate columns, which makes the road space under the bridge clearer.

The natural stone elements removed and restored before construction began were added again at the end. The stylish structure designed by Marx Krontal Partner shows that railway bridges can continue to be built compatibly with heritage protection but still innovatively as well. The approach to the solution could be transferred to hundreds of other oblique angled steel bridges in the Deutsche Bahn network. This would enable the railway company to confidently meet its Baukultur responsibility to the city and landscape.

Facts

Design and construction: 2011–2019
 Developer: DB Netz, Hanover
 Designers: MKP – Marx Krontal Partner, Hanover

Cost: €7.0 million

More information in the project description in the appendix on p. 120

Baukultur Retains Public Transport Connections

Multipurpose Railway Station, “Bürgerbahnhof” Cuxhaven – Cooperative Engagement for Public Infrastructure



BAUKULTUR AT A GLANCE

- Retention of the station building as a gate to the town
- Railway station as a vibrant public place
- Civic engagement by forming a cooperative



Railway stations have always been gates to the city and to the world. They lend the place a face and are part of its identity. But the architectural welcoming culture – at the end hardly still fostered – came to an end in many places between 1999 and 2019: The Deutsche Bahn parted ways with 2,250 unprofitable station buildings in need of renovation. Several of them then remained closed and neglected for years. The citizens of Cuxhaven did not want to stand idly by in the face of such a development. Even more, they did not want their town railway station, which opened in 1898, to be demolished to make way for a retail park. Among other things, the town on the River Elbe estuary lives from tourism. Many working people use the railway daily to commute to work. They all need a place where it is pleasant to wait, they can get a coffee bright and early and where there are not only ticket machines, but also a proper travel centre.

Precisely such an appealing, desired railway station opened in Cuxhaven in December 2018. To achieve this, the people in Cuxhaven had formed a cooperative five years before. At the first meeting, 49 members subscribed to a total of 99 shares

at 1,000 euros each. The number of those who purchased shares quickly rose to more than 500. The volunteers beat the drum for their cause, set up networks, undertook professional preliminary planning and applied for funds from the state of Lower Saxony. Ultimately, Bürgerbahnhof Cuxhaven eG finally bought the historical building and initiated the conversion. When it came to demolishing the side building, as it became clear that the mortar could only be removed from the valuable clinker by cost-intensive manual work so that the tiles could be saved for reuse, the citizens determinedly picked up hammers and chisels themselves. The attractive, light town railway station of Cuxhaven is now a venue of which all are proud. It is operated by the cooperative on its own responsibility, while Deutsche Bahn is now a tenant.

Facts

Design and construction: 2013–2019
Developer: Bürgerbahnhof Cuxhaven
Designers: Agentur BahnStadt / stationova, Berlin
Size: approx. 1,400 m²

Cost: approx. €5.3 million

More information in the project description in the appendix on p. 120

the stations. Even in main railway stations such as those in Fürth or Dortmund, all platforms are by no means accessible. On the other hand, the number of passengers has increased – by 26 % to 2.9 billion yearly from 2009 to 2019. In 2019, the railways recorded 151 million travellers, also a record in mainline traffic. This number is planned to double yet again by 2030 with the introduction of a basic interval timetable (BIT). Many stations would be unable to cope with these passenger numbers and therefore face far-reaching transformations. The introduction of a temporary 9-euro ticket in the summer of 2022 showed that the existing infrastructure is barely able to cope with higher passenger volumes.

Another challenge is the inadequate condition of the local and regional railway stations. In Saxony-Anhalt, the “REVITA” programme has been used since 2006 to fund the revitalisation of urban and suburban rail station buildings – regardless of whether they are under public or private ownership.

These measures must not only secure the crossover between different means of transport but also place increased value on Baukultur. The historical first railway stations were like modern city entrances and were intended to make a favourable impression on passengers arriving at the location. Today passengers are mostly led around the building on the platform. Attention to specific design is at best only given to flagship projects. Yet inside, even the railway stations of the state capitals ultimately look the same.

Wish for more offers for travel necessities

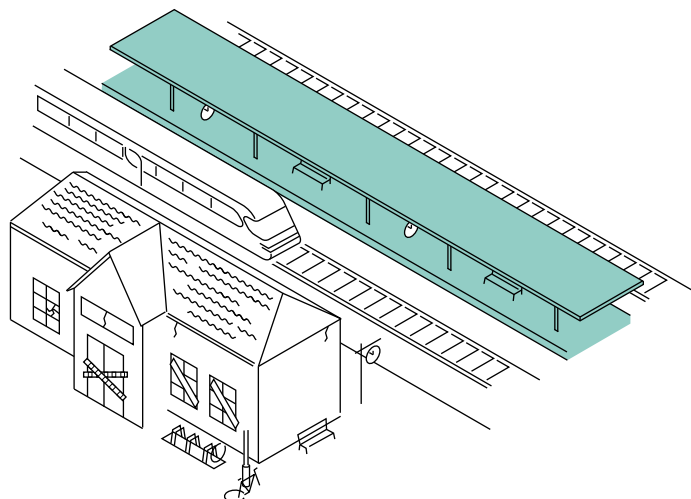
85% of the population would like shopping options in a railway station for travel necessities, such as a bakery or newspaper shop. **P8**

Passenger building

- € – mainly by means of rental income by the respective owners
- only minor public funding

- § – Building code (BauGB), building regulations of the federal states, etc.

Around 2,300 passenger buildings in Germany, of which 30 % owned by Deutsche Bahn 70 % owned by others



Transport station and passenger building

Differences in the funding, official competence and legal basis

Sources: Allianz pro Schiene; VBB 2021

Transport station including platforms, stairs, underpasses and signage/wayfinding systems

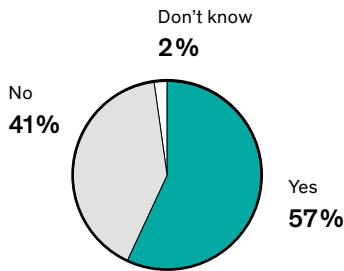
- € – via station charge by the transport company
- own funds of the infrastructure company
- retention, expansion and new build funded by the federal government and federal states

- § – General Railway Act (AEG)

Many people know of dilapidated railway stations ...

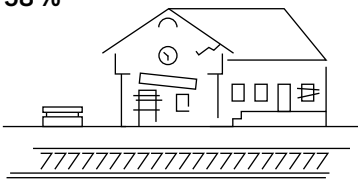
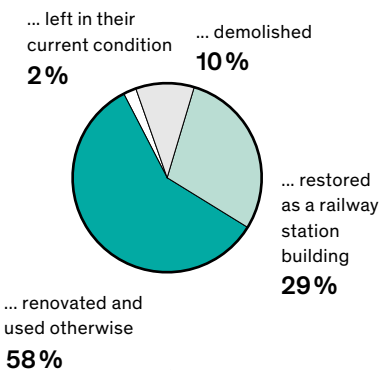
Source: Population survey for the Baukultur Report 2022/23

Do you know of a dilapidated railway station building?



... and there is a need for action!

These dilapidated buildings should be ...



Attractive and well-maintained railway stations needed

For a large part of the population surveyed, clean and maintained paths and platforms (97%), pleasant waiting areas (94%) and an attractive station forecourt (71%) are important or very important in a railway station. **P8**

The reason is the comprehensive rules on orientation, safety and accessibility, as well as the specified colour and material standards, which constrict design scope. Solutions matched to the location and the structures would be desirable. However, this would require greater design depth and the restoration of in-house design departments.

Baukultur ideas for the conversion of railway stations are therefore more and more frequently due to civic society engagement. In Cuxhaven, a cooperative was formed against the demolition of the station, which took over the historical building in order to renovate it and put it back into service. Today there are offices and an event hall on the upper storey while ticket sales, catering, WCs and a shop are accommodated on the ground floor. The railway fortunately also became a tenant in the railway station.

Similar multipurpose "Bürgerbahnhöfe" stations have been created throughout Germany as central social locations and initiators of the city. These successful projects can serve the municipalities and Deutsche Bahn as a model for the conversion of their own station buildings.

While multipurpose Bürgerbahnhöfe make the railways more attractive especially in less densely populated areas, decentralisation can reduce the overload of large city railway stations. Hamburg's main railway station, which has the highest passenger figures in Germany by far, will not only be relieved by a new glass transverse hall, but also by the relocation of the Hamburg-Altona station when Diebsteich, a through station on the main line, replaces the old terminal station. The fact that this new ICE stop became a railway station and was not merely equipped with a platform as a stopping point, is thanks to the engagement of the city, which developed the uses and an architectural concept for the end buildings via a design competition. Even in smaller cities, new secondary stops can relieve central junctions and at the same time can be an important stimulus for the urban or neighbourhood development there.

Future Developments When converting road and transport infrastructure, the present needs must be considered just as much as those of the future. The planning and construction of urban spaces cannot keep up with the fast development cycles in the mobility sector. Traffic spaces should therefore not be especially programmed for individual types and forms of transport but should be designed to be flexible. A traffic-neutral design that does without bollards, kerbs or busbars would be preferable to setting out specific traffic areas.

Not only the traffic, but above all the people would benefit from such a design, which allows all kinds of different occupancies. Depending on the time of day and day of the week, a judiciously created street could be used as a road, pedestrian zone, playing area or weekly market.

The traffic routes for autonomous, AI-based driving should and must not be conditioned. According to the Mobility Act of 2021, autonomous vehicles can already use the existing roads, as long as, like a regular bus, they always drive on the same route. If the principle gains acceptance, driverless buses could also integrate less frequented routes and out of the way rural places into the local public transport system at justifiable costs.

The transition from fossil fuels to electromobility, to reduce CO₂ emissions, is further advanced. While properties on which petrol stations stand currently offer increasing conversion potential, hardly any changes to the roads are

required. The only thing missing is a denser network of charging stations. Whereas a good 26,000 charging columns were installed at the end of 2021, the plan is for that figure to be one million by 2030. However, the risk that this poses to the street and cityscape as a result is large. Integrative planning, which is also often lacking for control boxes, would be necessary.

Initiatives such as “carfree Berlin” also criticise that the changeover to e-drives alone does not relieve the city centres from individual traffic.

Carsharing has steadily increased in importance in recent years: In 2021, there were almost three million car-sharers and more than 26,000 vehicles in Germany. Yet the offers to date mostly remain limited to the cities and at best have long-term prospects. Only 15 % of Germans would currently be prepared to forego their car and hire one if necessary (and only subject to improved availability!). Many tend to use sharing offers as an alternative to bicycle, bus and rail rather than their own car.

Attempts to relieve the city centres by optimising delivery traffic seem far more promising. The pandemic accelerated the rise of e-commerce enormously and with it the number of parcels delivered daily by courier, express and parcel services.

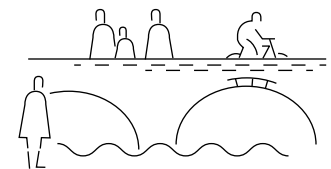
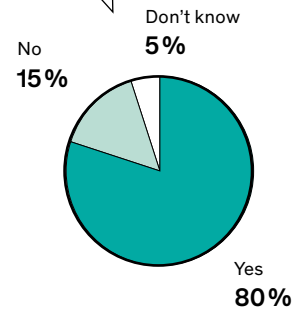
Decentralised transfer points (or *microhubs*) could defuse the situation. Five of these hubs are to be created in Berlin’s Charlottenburg-Wilmersdorf district, which will be used by multiple companies. From there, the “last mile” distribution within a radius of two and a half kilometres will take place on cargo bikes, whose use will be privileged by special loading and unloading zones. Goods transport in underground tube mail systems is repeatedly discussed. In 2030, a 70-kilometre-long test route will be opened in the Swiss canton Solothurn. However, using the existing infrastructure seems more obvious for cost reasons alone. At the beginning of the 20th century, goods trams in several of Europe’s cities used the regular tram rail network. In Frankfurt am Main, the possibilities of a *last mile tram* for parcel delivery are now being explored again; in Karlsruhe, the RegioKargo logistics initiative is pressing ahead with such plans.

These are only a few of many examples of how structures for the future can be converted from the existing city, if the potential of the existing is discovered, used and cleverly integrated. The conversion of city and land can only succeed with a Baukultur of Conversion along these lines.

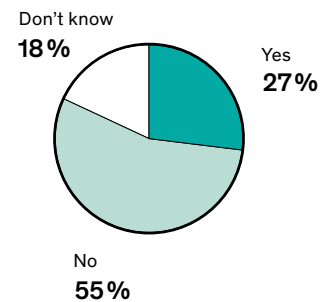
Infrastructure needs design too!

Source: Population survey for the Baukultur Report 2022/23

Do you think that infrastructure structures should be designed to be visually attractive?



Do you think that infrastructure structures are currently well designed?



Buildings and Infrastructures

Over the years and centuries we have used almost unimaginable quantities of material and energy for buildings and infrastructure. When preserving and upgrading the existing building stock, it is not only a matter of saving energy and emissions. Humankind also accomplished great intellectual and cultural achievements with the design, construction and maintenance of these structures. Retaining and converting them where possible is part of our social responsibility and can help to preserve cultural values. Likewise, examining the existing stock can promote the emergence of a contemporary architectural style. A *Baukultur* of Conversion takes into account subsequent adaptations in the design of new buildings and facilitates them through spatial flexibility and simple construction methods.

Climate Protection Only With the Existing Building Stock

Conserve Grey Energy Less than half of the energy expenditure required by an Efficiency House 55 during the course of 50 years is attributable to running it. The greater part is due to the so-called grey energy. Grey energy is the primary energy necessary to manufacture the construction materials, for transport routes, construction and dismantling of the building and for disposal. However, grey energy is only conditionally suitable as an indicator of how climate-friendly a building is. The energy expenditure is not simply indicative of the emission of greenhouse gases. One reason: sun, wind and geothermal energy account for an increasingly large share of the energy mix in Germany. Whereas in 2010, 17 % of the electricity consumption was covered by regenerative sources, in 2020, that figure had already risen to 45.4 %. During the same time, the rate of renewable energy for heat and cold generation rose from 12.4 % to 15.2 %.

More reliable statements about the climate effects of the construction and building industry allow direct consideration of the emissions, which ultimately influence climate change. The construction and building industry is responsible for roughly half of global CO₂ emissions (see *Unrecognised Values* chapter) and is thus decisive for the success of the climate transition. As with energy, the share of emissions released by new buildings during operation can be significantly lower than the share caused by the manufacture of materials and construction.

Nevertheless, until now the energy efficiency during operation has mainly been assessed and required in standards. The German Environment Agency urges the introduction of “mandatory, individual renovation plans”. The amendment of the EU Performance of Buildings Directive (EPBD) should – if the European Commission has its way – even contain a renovation obligation. Because the building efficiency resolution passed in 2021 specifies minimum insulation values for public buildings that older buildings can hardly meet, professional and environmental associations have criticised it as a “demolition order” and as counterproductive for its climate protection targets.

The fact that sole consideration of the insulation values falls short is shown by a study conducted by the Wuppertal Institute on behalf of the Federal Foundation of Baukultur: For a reinforced concrete and brick detached house built in 2020 to the Efficiency House 40 standard, the CO₂ emissions during use account for less than 8%. Most emissions, over 90%, occur during the manufacture of the construction materials, due to transport routes and during the construction phase. The period up to 2050 was considered; after that time, according to the “European Green Deal”, the EU and thus also the energy mix should be climate neutral.

An existing building renovated to the same energy efficiency standard, on the other hand, causes only a third of the emissions of a new building by 2050. Even with the Efficiency House 85 standard, it is only 40% of the emissions. Demolishing a house for a more energy efficient new building thus makes less sense from an ecological view than to retain and convert it.

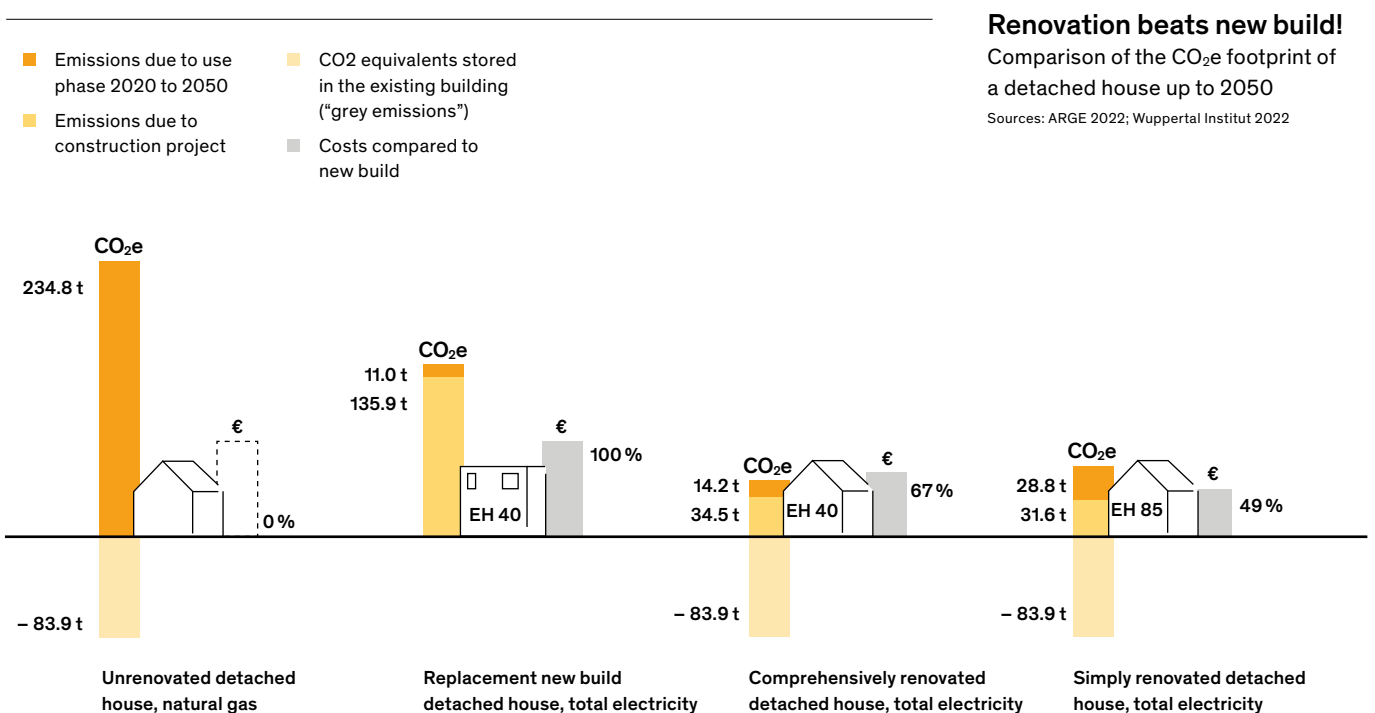
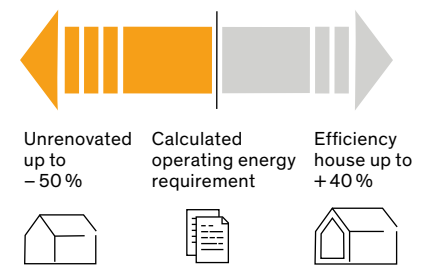
According to the study, rebuilding the German building stock would release 5.85 billion tonnes of CO₂ equivalents for the production of construction materials alone. That is 70 tonnes per capita – and 75% of the CO₂ budget that each of us may consume in absolute terms as of 2021. This makes the importance of our building stock even more clear: Only a clever Baukultur of Conversion, which uses the grey energy, or rather the grey emissions of existing buildings, and pays attention to the environmental footprint of the materials used for repurposing, can achieve a sustainability level in construction that meets the climate and environmental protection targets.

In addition, the actual consumption of new buildings rarely corresponds to their calculated energy efficiency. The reason is the performance gap which, among other things, is due to improper operation or incorrect device settings. An analysis of studies states that according to the BBSR’s calculations, this deviation is around 20%, according to other estimates it can even be as high as 37%.

The performance gap

The consumption of operating energy differs from the calculated demand due to the “human factor”. The preboud effect reduces the consumption in unrenovated buildings due to careful, economical behaviour, the rebound effect increases it in an efficiency house (EH), for example, due to higher room temperatures and more frequent ventilation.

Sources: BBSR 2019; Wuppertal Institut 2022



Renovation beats new build!

Comparison of the CO₂e footprint of a detached house up to 2050

Sources: ARGE 2022; Wuppertal Institut 2022

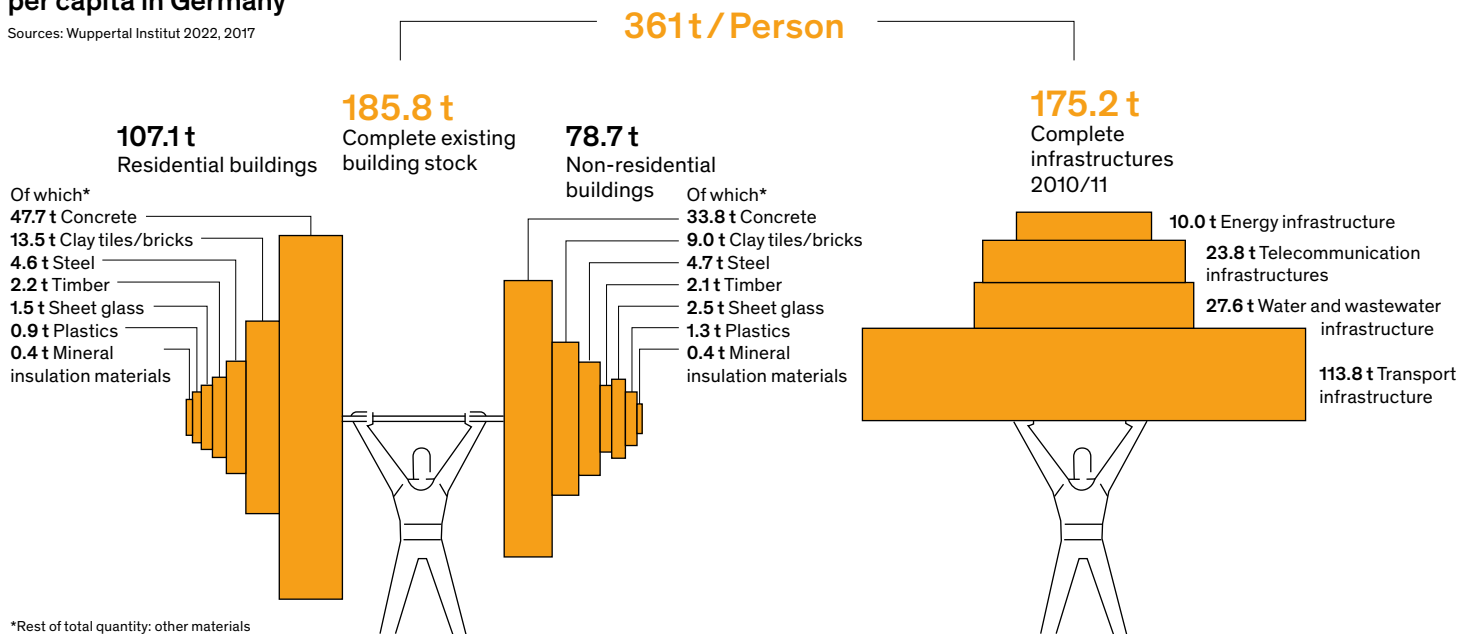
The CO₂ tax introduced in 2021 is initially only due for fossil fuels. That makes running less energy efficient properties more expensive and initially creates a further incentive to demolish these mostly older buildings. If construction materials were also taxed according to their greenhouse gas emissions, it would not only benefit the retention of existing buildings but also Baukultur. Using high-quality materials would be more lucrative than cladding a building with a short-lived thermal insulation composite system.

When handling infrastructure buildings, the public sector must also take into consideration grey emissions and design aspects. Grey energy is also retained when old bridges are not demolished and rebuilt but are renovated and upgraded. Most of the more than 25,000 railway bridges in Germany were built from the tail end of the 19th century and early 20th century. This shows how well these transport structures obviously could and can meet even highly changed uses. In addition, they are often thoughtfully designed works of the art of engineering. The fact that concerns regarding functional buildings and structures should also not be neglected is shown by the population survey: 80 % of the people find that an attractive design is also important for infrastructure buildings.

However, especially older bridges, which were mostly erected using the composite method (rolled beam in concrete), as steel or vaulted arch constructions, often have substantial need for rehabilitation. In a joint project, Deutsche Bahn and the Technische Universität Dresden researched the rehabilitation of vaulted arch bridges. According to the study, the installation of a half-through

Building and infrastructure material stock per capita in Germany

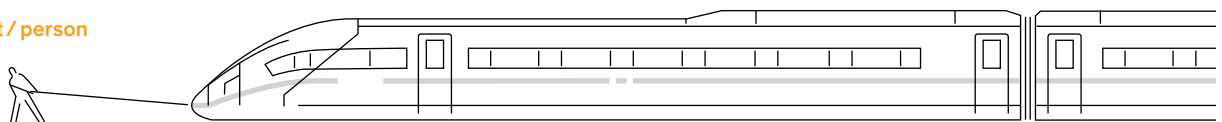
Sources: Wuppertal Institut 2022, 2017



By comparison:

Full ICE 3 (6-carriage) train = 348.9 t

361 t/person



(trough) deck made of concrete benefits the load distribution and drainage. At the same time, the safety spaces required at high speeds are also created. By repairing the small Tiergarten Bridge in Hanover, 90 % of the material and CO₂ emissions which would have occurred with a new build were saved.

In recent years, however, replacement new buildings and structures have mostly been built as part of the Deutsche Bahn modernisation programme. According to the Bundesschienenwegeausbaugesetz (BSWAG, Federal Railway Development Act), the federal government only subsidises investments in demolition and new build. The railway company must pay for repairs, which preserve the fabric, from its own working capital.

There is a particular need for road bridge renewal in the west German states. Half the bridges there were built in the 1960s and 1970s. In 2021, the Bundesanstalt für Straßenwesen (German Federal Highway Research Institute) assessed the condition of 70 % of the around 40,000 bridges in the federal trunk road and motorway network as satisfactory or adequate. The fact that increasingly shorter rehabilitation intervals are required is due to the higher loads and frequencies to which the bridges are subjected: In the past 40 years, the traffic on Germany's trunk roads and motorways has almost doubled. 4.5 % were classified as insufficient or inadequate – that still means 1,800 bridges. A total of 4,000 road bridges must be modernised in the next eight years.

The life and rehabilitation interval of a bridge are calculated on the basis of bridge logs, depending on the number of load cases. More precise, continuous data could be provided in future by sensors, which are integrated in the structure. If these data are transmitted to a digital twin, statements can also be made about structural conditions in inaccessible places and damage can be predicted.

However, it is not sufficient to merely monitor the bridges. They must also be maintained to prevent years of negligence from making a replacement new build unavoidable. Until 2021, motorways were the responsibility of the federal states. Since then they have been the responsibility of the federal government's own Autobahn GmbH. This is intended to improve the condition of the motorways with their 28,000 bridges. From 2022, the number of motorway bridges rehabilitated annually is to be doubled from 200 to 400.

In many cases rehabilitation is dispensed with to minimise traffic restrictions: replacement new structures can be built alongside the existing bridge. Occasionally it would suffice to replace individual structural members. Where the load increases, partial upgrading can provide a suitable solution. In the case of the compressed concrete bridge over the River Elster in the Brandenburg village of Neudeck it was sufficient to renew the end faces. The appearance of the over 100-year-old traffic structure was therefore retained. New construction materials such as ultralight or textile concrete also open up alternatives to demolition for bridge rehabilitation.

Achieving Climate Protection Goals In its *Klimabauplan* (Climate construction plan), the Association of German Master Builders, Architects and Engineers (BDB) calls for an increase in the annual rehabilitation rate to 4 %. The federal government had already demanded a significant increase in this rate in 2010. With its "European Renovation Wave" action plan, the European Commission also aims to increase the renovation rate.

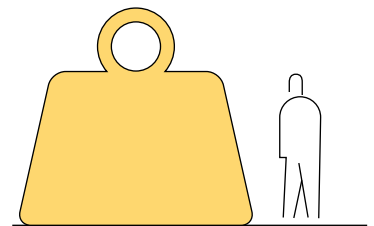
CO₂ in the existing building stock

If manufactured today, the materials stored in the existing building stock would cause greenhouse gas emissions amounting to 5.85 billion t CO₂ equivalents.

Sources: BBSR 2020; Statista 2022; UBA 2022, 2021; Wuppertal Institut 2022

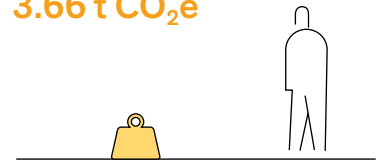
Manufacturing the material in the existing building stock again today would equate to per capita emissions of

70 t CO₂e



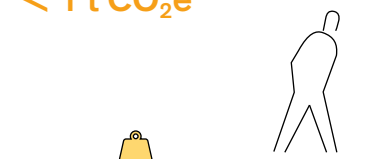
The annual CO₂ emissions of the construction and building sector in Germany is equivalent to per capita emissions of

3.66 t CO₂e



The ideal CO₂ footprint per person per year

< 1 t CO₂e



However, in 2016, the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR) criticised that “in its present form, the much quoted renovation rate is hardly suitable as a policy target” because of a lack of data. Changes compared to previous years can also hardly be tracked.

One point of reference is that state funding for energy-efficiency upgrades is used much more frequently. According to the estimates of the Haus & Grund association of owners, the rate is likely to be even higher, because many private properties are renovated without grants.

A multilevel approach is required in order to reduce CO₂ emissions through renovation and achieve the climate goals. This includes reducing heat losses through insulation measures as much as equipping buildings with efficient heating technology and the use of renewable energy.

Energy-efficient renovations do not generally require planning permission. Nonetheless, they have design consequences. If façades are fully clad or wooden windows are replaced by plastic profiles, that has far-reaching consequences for the look and feel. Façade insulation is disputed from an ecological point of view: Its life cycle assessment is frequently poor, insulation materials are difficult to recycle or are not at all recyclable and existing nesting sites for birds or bats are lost. A sense of proportion is therefore needed: Characteristic details should not fall victim to maximisation of the energy saving potential.

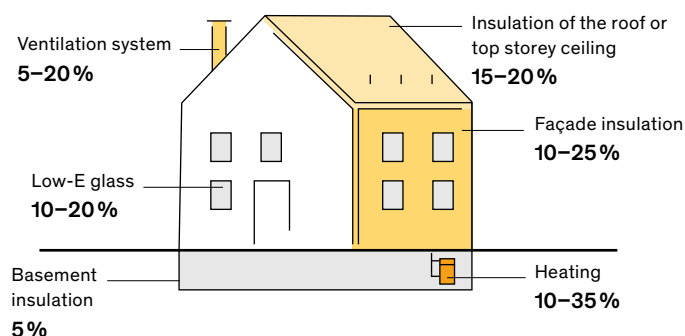
The energy consumption can be reduced substantially, without impairing the architectural quality, by modernising the building services, for example, by installing condensing boilers or furnaces. Approximately the same energy savings as those achieved by façade insulation can also be achieved by upgrading the roof or the top storey ceiling – measures that have hardly any influence on the look and feel of the building.

A study by the Chairs of Architectural Conservation and Design and of Building Physics of the Technische Universität Dresden came to the conclusion that a combination of individual interventions can be an alternative to full insulation of historical façades. A house on the Regensburg Margaretenau development built in the 1930s was renovated in a research project by the Ostbayerische Technische Hochschule Regensburg funded by the federal government. Instead of a disfiguring insulation layer, a solar-active render was applied. The energy gained in this way is used for heating and supplements the energy system consisting of combined heating and power station (CHP) and photovoltaic modules.

Potential saving through energy-efficient renovation

Possible energy saving through different measures as part of a renovation

Source: Verbraucherzentrale Bundesverband



Economic aspects must also be taken into consideration in an energy-efficient conversion. At the Wohnungsbautag 2022, the ARGE eV working group for contemporary building called for a procedure involving a sense of proportion to be applied for reasons of feasibility: Instead of the Efficiency House 40 standard, an Efficiency House 70 should be the goal for new buildings and instead of Efficiency House 50, an Efficiency House 115 for renovations. With regard to the climate goals, it makes more sense to invest the funds saved in generating renewable energy.

The *Klimastudie* (Climate Study) commissioned by the Zentraler Immobilienausschuss (ZIA, German Property Federation) came to the conclusion that insulation that extends beyond the requirements of the Building Energy Act leads to only small energy savings but more CO₂ emissions due to the use of resources. Taking into consideration economic aspects, the study on *Klimaneutralität vermieteter Mehrfamilienhäuser – aber wie?* (Climate neutrality of rented multifamily dwellings – but how?) also advises against insulation thicknesses above 14 centimetres, because they achieve hardly any additional improvements.

Instead of targeting the best possible thermal insulation, it is necessary to start with the worst insulated buildings and therefore renovate as many residential buildings as possible moderately. According to the announcement of the Bauministerkonferenz (Conference of Ministers for Building) at the end of 2021, “relinquishing the one-sided focus on building insulation” could free up funds for developing renewable energy. Resource-saving heating technology is necessary even before building renovation, in order to improve the energy balance. The replacement of heating boilers, which the Building Energy Act specifies after 30 years anyway, is particularly promising.

In addition, the Coalition Agreement stipulated that from 2025, only heating systems that have at least 65 % of their energy demand covered by renewable sources should be installed. The federal government backs heating pumps and announced a corresponding initiative in March 2022. The talk is of six million units installed by 2030. It remains to be seen whether industry and the skilled trades have sufficient capacities for this. The technology still has to make advances for its use in old buildings. At present, the low flow temperatures can require an additional condensing boiler in many places.

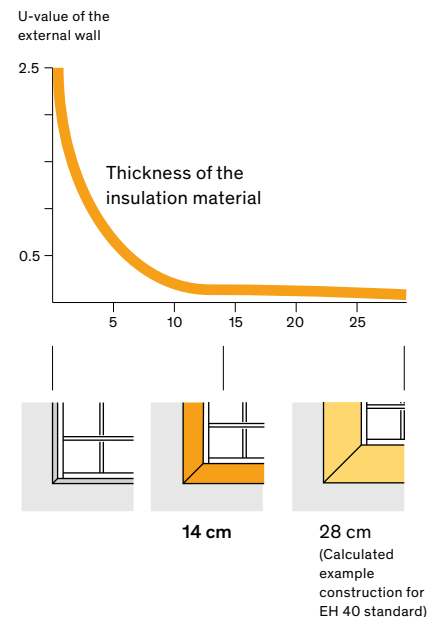
Solar thermal energy and photovoltaics should also be used more. In fact, an increasing number of federal states are following municipal pioneers and are introducing mandatory photovoltaics for new buildings. The Naturschutzbund Deutschland (NABU, Nature and Biodiversity Conservation Union) noted that decentralised electricity generation on walls and on roofs – unlike solar farms – do not use any additional land areas.

On the other hand, the *Verantwortung übernehmen. Der Gebäudebereich auf dem Weg zur Klimaneutralität* (Accept responsibility. The building sector on the path to climate neutrality) report of the ZIA claims that such an obligation can make hardly any noteworthy contribution to the production of climate-neutral energy. The potential area is too small. At the same time, in addition to the resulting cost increases in new build, the look and feel of the systems is also criticised. Integrating photovoltaic modules in a house is indeed a design challenge. Many municipalities and states support those involved in construction by providing design guidelines, for example the *Solaranlagen gut gestalten* (Design solar systems well) guidelines published by the Bavarian state government. The

Insulation performance reduces with insulation thickness

Starting from 14 cm insulation thickness, the insulating effect is no longer increased significantly. Determination of the U-value of an external wall with retrofitted insulation by way of example.

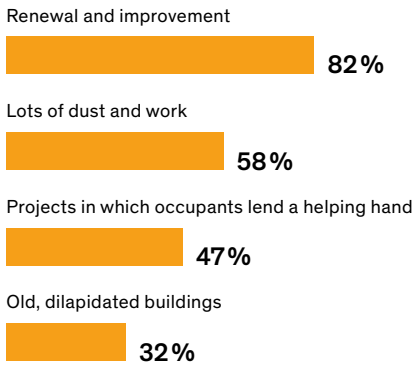
Sources: Bienert 2021; Wuppertal Institut 2022



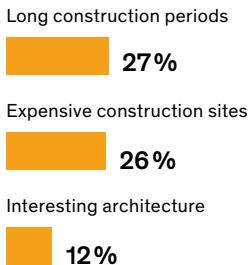
Associations with the term “conversion”

Source: Population survey for the Baukultur Report 2022/23

Four out of five respondents find conversion to be something positive!



Only one in ten see design potential in conversion.



typical clay tile covered roofscapes in many cities and municipalities are an important part of the Baukultur identity, which is harmed by extensive use of additive photovoltaic modules. It is therefore necessary to weigh up costs and benefits, focus on compatible installation situations and promote integrated building solutions.

The Potential of Conversion

Contemporary Design The Baukultur of Conversion marks a departure from modernity, for which the break with the past was dogma. Where older fabric remained, many architects of the 20th century sought to disengage themselves from it – for example, by separating additions by glass joints or deliberately creating material contrasts.

With the criticism of functionalism, more specific interventions became more frequent. Whereas mainly historically significant buildings have been converted since World War II, the Baukultur of Conversion also focuses on less popular everyday buildings. Instead of juxtaposing old and new, it is a matter of a self-assured examination of the existing structure in order to create something new.

The conversion projects of Flemish architectural firms, whose popularity is also based on the transparency and traceability of the interventions, set the example in Europe. Although interwoven with each other, it is still possible to recognise where the existing building ends and the intervention begins.

Conversion differs from other interventions in the existing building stock. First of all there is the restoration, which aims to restore an earlier condition. A renovation seeks to rectify minor defects. In contrast, according to the fee scale for architects and engineers (HOAI), modernisations involve “structural measures for sustainable increase in the use value of a property”, while extensions are defined as “additions to an existing property”. However, only a conversion, which is accompanied by “significant interventions in construction or existing building” changes the spatial structure. It can but does not have to be accompanied by changes in use.

On the Magdeburger Domplatz, for example, a centuries old building will be used as a hotel after conversion – and exceeds the standard of many present-day new hotel buildings through its charm, individuality and material quality.

However, the potential is not yet recognised: Three quarters of the respondents in the population survey agreed completely or somewhat that an old, converted house is more individual than a new build. 82 % associate the term “conversion” with renewal and improvement. But only 12 % of those surveyed expect interesting architecture as a result.

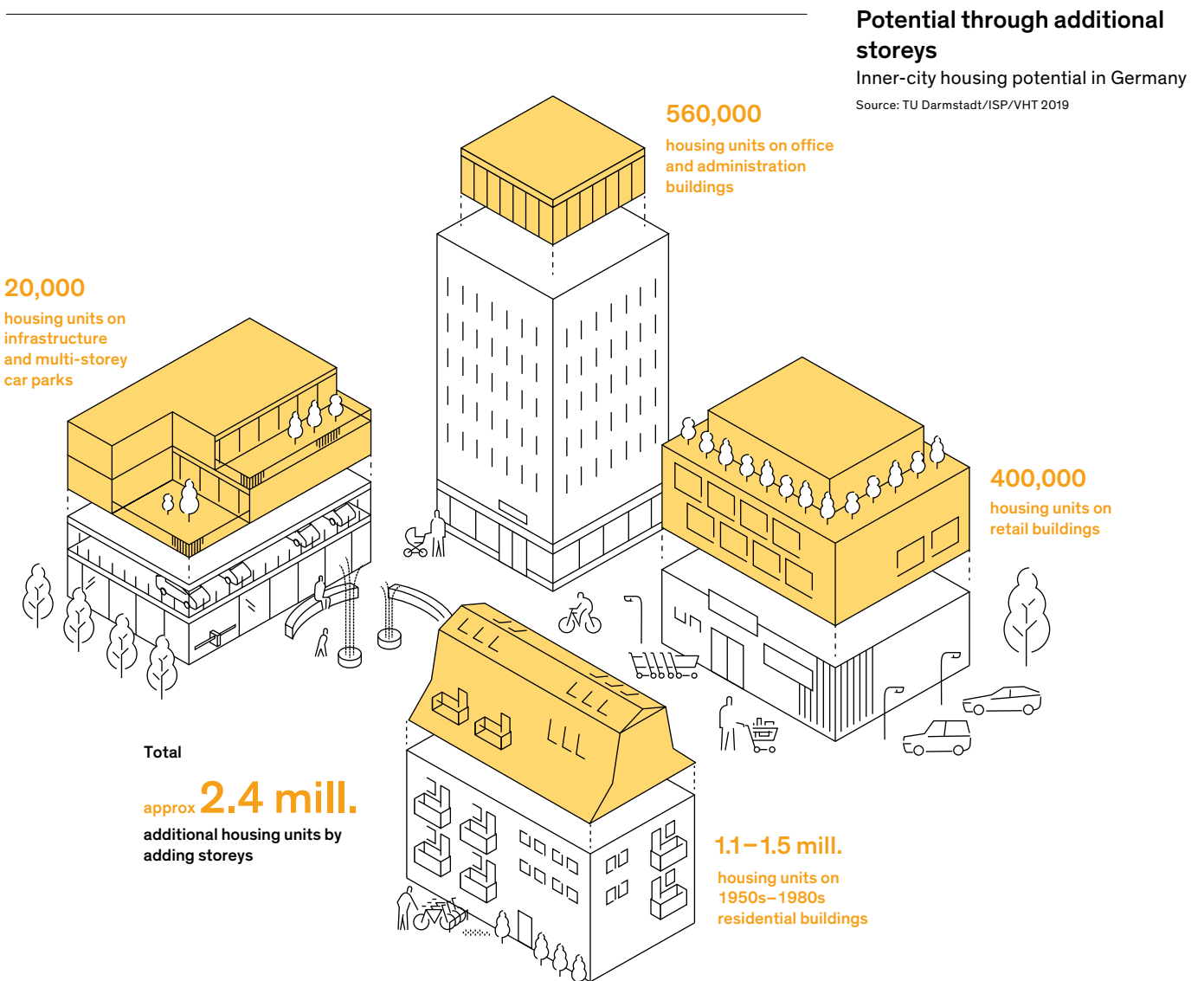
In new build, the design standard is far more likely to be secondary to the maximisation of profits. Since the 1960s, skilled manual work has increasingly made way for building components mass-produced off site – one of the reasons for the facelessness of many new buildings. Not only the system buildings of large chains, but also the majority of office and residential buildings appear downright placeless in their uniformity.

On the other hand, basic requirements set by the existing building can encourage creative, unique solutions. The Hamburg Elbphilharmonie concert hall, for example, also owes its shape to the fact that the external walls of the

listed wharf warehouse A limited the floor area, which forced the design team to opt for the landmark layering of the uses.

By examining that which is already there, its adaptation and optimising further development, a one of a kind usually emerges that cannot be found anywhere else. Consciously anticipating this individuality can bring about previously unseen structural forms. A new Baukultur of Conversion can therefore be the answer to the search for a new, contemporary design language.

Affordable Housing Cost-effective living space can be created by converting empty office buildings. In its research report, *Wohnungsbau – Die Zukunft des Bestandes* (Housing – The future of the existing building stock), the ARGE eV working group for contemporary building explained that four million apartments could be created throughout Germany by repurposing, adding additional storeys and redensification. Accordingly, office and administration buildings alone offer space for almost two million apartments in the coming years. The *Deutschlandstudie 2019* (Germany study 2019) identified a potential of 2.3 to 2.7 million new apartments, 350,000 of which in unused office and administration space alone.



Baukultur Makes History

Wittenberg Castle – Developing the Architectural Qualities



In 2017, Lutherstadt Wittenberg used the 500-year anniversary of the Reformation as a reason to further renovate the old part of the town and to redevelop the UNESCO World Heritage site.

The castle, neglected for decades, was therefore given new importance. Situated at the western entrance to the town, it lent itself to use as a visitors' centre. In addition, the Evangelische Kirche Deutschland (EKD, Evangelical Church of Germany), the State of Saxony-Anhalt, the town of Lutherstadt Wittenberg and the Stiftung Luthergedenkstätten in Sachsen-Anhalt (Foundation of Luther memorial sites in Saxony-Anhalt), agreed to concentrate the church and museum facilities in one location: The Evangelical seminary, accommodated for 200 years in the Augusteum building at the Luther House, was to move into the castle and be given direct access to the castle church, which was used by the vicars as a highly symbolic educational institution. Furthermore, a Reformation history research library was to be established in the castle. The rooms vacated in the Augusteum

were then to be available for extended museum and exhibition operations of the foundation.

There is not much more left of the prince electors' castle built under "Friedrich the Wise" from 1489 with its lofty residential towers, other than the thick external walls and the characteristic spiral stone staircases in the courtyard: These two stair turrets once provided access to the upper residential storeys. In 1817, the Prussians converted the castle that had been destroyed during the Wars of Liberation into a stronghold. They built solid partitions in the gutted palace, to which they then added barrel vaults in the top storey, and then covered them with a thick layer of soil as protection against firebombs. "Existing buildings teach us to rethink", said architect José Gutierrez Marquez. Routines do not help us to progress. It is not form that follows function, but rather the function of the encountered form. For the architect team of Bruno Fioretti Marquez, the vaulted interiors of the stronghold architecture seemed perfect for the research library. 15th century panel paintings inspired them to install half-high oak shelving with

reading desks to provide a monastic look and feel and which do not hinder the spatial flow. Room for the compact magazines (storerooms) and the strong room for the valuable early prints was found in the mezzanine. The team tied into the tradition of the Augusteum building for the accommodation of the seminary. They imagined a kind of monastery courtyard with cloister. The area above the vaults, which had already been covered with soil in the past, lent itself to this. As the supporting structure of the barracks building is designed for large loads, it was possible to build a structure made of lightweight concrete on top of it. To the left and right of a wide middle aisle, seminary rooms alternate with greened light wells. The wall plinths under the windows are used as benches. The courtyards provide areas for peace and an outlook under the open sky.

One challenge was accessible access to the use levels with their different heights. Since the conversion into a stronghold, the connections of the old castle stairs no longer fitted. The stronghold builders created new passages and small intermediate stairs, which no longer met present day safety requirements. It was therefore necessary to make openings through all storeys for the new staircases and lifts at the southern and northern end of the complex. "We initially built bridges from door to door, and then we built stairs from bridge to bridge, each at a different angle, in a different movement across various half-landings." The result is a unique but completely compliant stairwell made of in-situ concrete, which stands clear of the exposed walls of the bastion and castle architecture.

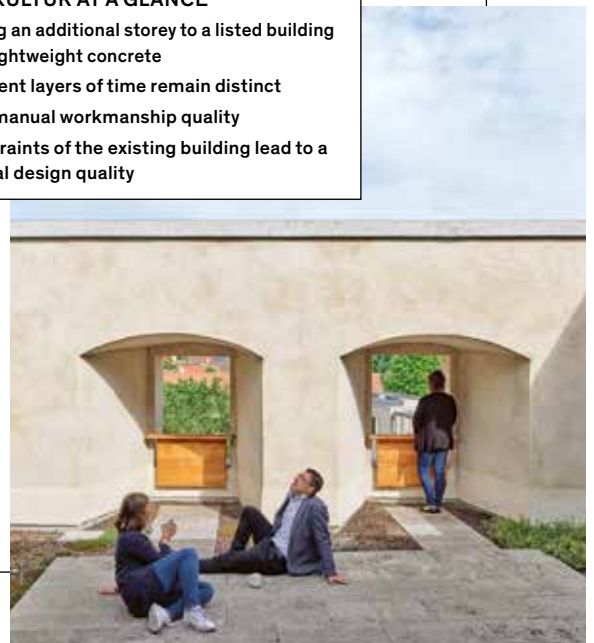
Bruno Fioretti Marquez like to compare their work to that of an old parchment manuscript on which texts have been repeatedly scratched out and written over anew. Just like the case with such a palimpsest, in Wittenberg Castle the old layers under the finely whitewashed surfaces are also visible. At the same time, thanks to the careful skilled manual treatment of all details, the castle has gained a new, dignified historical layer.

Facts

Design and construction: 2011–2017	Sachverständigenbüro Arnhold, Weimar
Size: 10,538 m ²	Cost: €17.17 million
Developer: Lutherstadt Wittenberg	
Designers: Bruno Fioretti Marquez, Berlin;	More information in the project description
ifb – Frohloff Staffa Kühn Ecker Beratende Ingenieure, Berlin; INNIUS DÖ, Dresden;	in the appendix on p. 121



- BAUKULTUR AT A GLANCE**
- Adding an additional storey to a listed building with lightweight concrete
 - Different layers of time remain distinct
 - High manual workmanship quality
 - Constraints of the existing building lead to a special design quality



In view of the demographic change, demand for small and inexpensive apartments suitable for older persons will probably increase. According to forecasts of the Federal Statistics Office of Germany, the number of people aged 65 or older in Germany will increase from around 18 million today to over 23 million by 2040. According to estimates, more than 3.1 million people in this age group are currently affected by mobility impairments. However, a maximum of one million accessible apartments are available at present.

A type catalogue developed at the Technische Universität München for the transformation of office space therefore also explicitly addresses the creation of living space suitable for the elderly. Office buildings to be converted are particularly attractive for this purpose due to their often central location and their fitout, which generally also includes lifts.

It remains to be seen whether the trend toward working from home will persist beyond the pandemic and therefore if office areas become available as a result. The BBSR has pointed out that 10 % of the new living space created in Berlin is already developed in non-residential buildings. In Frankfurt am Main, the figure is 20 %.

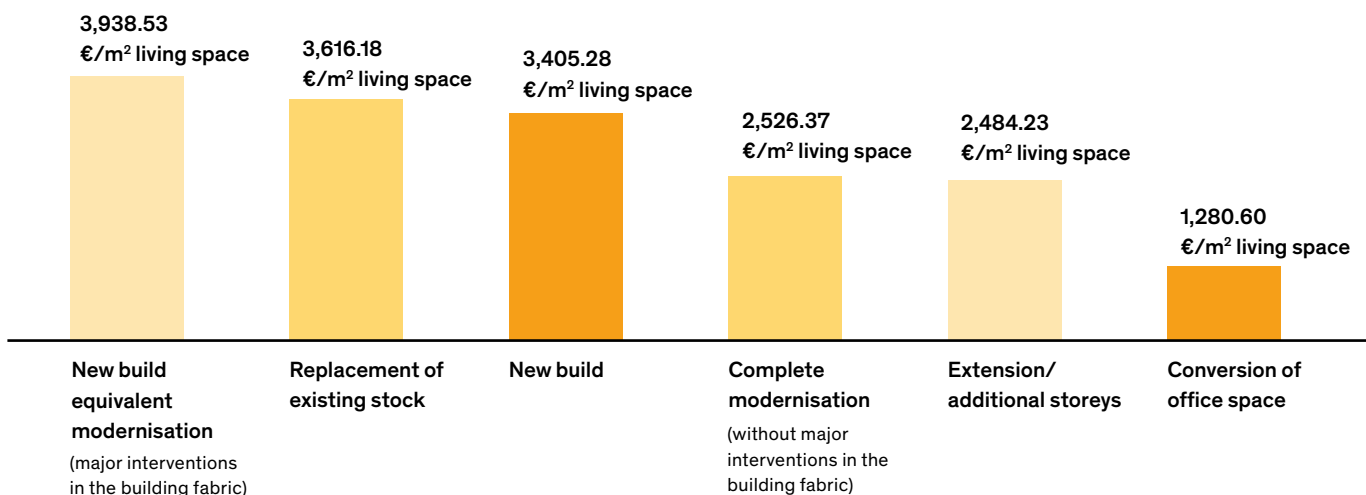
According to the BBSR, there is nothing in the current state building codes that stands in the way of repurposing, as long as the authorities are open to the idea. Decisions in which Frankfurt's building control office fully exercised its discretionary powers were also upheld in court.

Inexpensive apartments can also be created by redensification of existing settlements, because the cost of land and development there are low or not at all necessary. In view of rising building land prices, an important argument. In order to keep the conversion costs (and thus the rents) low, it is necessary to define the required quality standards from the outset. The ARGE eV report suggests that "modernisation equal to new build" of a residential building can be far more expensive than a replacement new building, if it requires extensive interventions in the building fabric and floor plan. Full modernisation, which is limited

Construction cost comparison

Comparison of the average gross costs for different housing creation options (4th quarter 2021)

Source: ARGE 2022



to smaller interventions and the removal of barriers, would be considerably less expensive. Instead of prematurely following trends and fashions, it pays to discover the merits of the construction methods, building elements and housing floorplans of the post-war decades – even if these need a second look to identify them. Renovating the building stock to supposed new build level without considering its peculiarities will be expensive. Working with the existing building creates character and saves costs.

Another possibility for reducing costs would be to relax rules for building in existing fabric. Above all, regulations on setbacks and separation distances, on fire protection, sound and thermal insulation, on the provision of parking spaces and on accessibility can drive up costs (see *Legal Framework* chapter).

Use Living Spaces Efficiently It is also necessary to scrutinize the fact that we need more and more space. In only three decades, the living space per person has grown by almost a third. Whereas it was still 34.9 square metres in 1991, in 2020 it was already 47.4 square metres. Since the start of the Covid 19 pandemic, many people are spending more time within their own four walls. This has further fuelled the demand for larger apartments.

Spatial quality, however, does not depend on the number of square metres. Intelligent floorplans can ensure that even small apartments can be used in diverse ways. This does not require any massive interventions. Rooms can be arranged completely differently with furniture and furnishings. Experienced interior designers can help with the redesign and increase the usability of existing apartments.

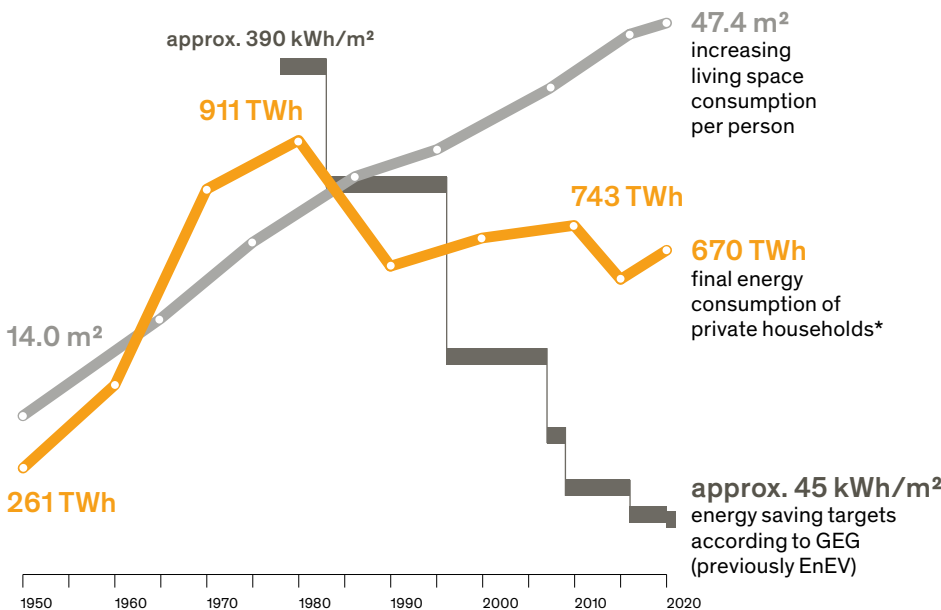
Contrary trends can also be determined: In many building cooperatives and housing projects, the personal living space is limited, and there are more jointly

Wish for more housing space in large cities

In places with more than 500,000 inhabitants, half those surveyed would like additional rooms (48%) and more living space (51%). P2

Rebound effect

Sources: AG Energiebilanzen 2021; dena 2016; Destatis 2012; GEG 2020; INSM 2009; Kühnhenrich 2014; Statista 2021



*up to 1989: old federal states incl. small consumers, converted from SKE (coal units) to TWh

used areas instead. Especially for older people, it can be attractive to divide their own detached house into several apartments: While property developer companies aim at demolishing such properties in order to build new buildings, redensification by subdivision can help to preserve existing building stock. Apart from adjustments to the site development (public utility and road connections) and the heating technology, the greatest hurdles are building regulation requirements – for example, if the local development plan does not permit conversion into a multifamily dwelling.

Using housing areas efficiently also helps to counteract the so-called rebound effect. According to estimates, a quarter of all savings achieved by more efficient, cost-saving heating systems are nullified because the room temperature is increased after the installation. The increase in living space has also led to a higher energy demand with more emissions and thus counteracts part of the savings resulting from higher energy standards.

A study on behalf of the Vereinigung der Bayerischen Wirtschaft (vbw) comes to the conclusion that more than ten megatonnes of CO₂ equivalent of greenhouse gases could be saved annually if the housing space were reduced by 15 % to

Baukultur Preserves Resources

Korbach Rathaus Extension – Using the Anthropogenic Stock

In the 1970s, an annex was added to the mediaeval Rathaus (town hall) in the district town of Korbach in Hesse. In a manner typical of the time, the Brutalist building extension disregarded the context. After three decades, in view of functional and building physics defects, a competition was held to optimise the annex. However, as the structure offered hardly any possibilities for improvement, designs for a replacement new building were requested in a second call for proposals. As a result, the historical Rathaus, which was renovated, was given an extension building that upholds the form of the heritage building as a matter of course. A further, elongated building was created at its rear. Thereby, not only were contemporary administration rooms created in a central location, but after more than 40 years, the urban planning deficits have now also been eliminated: While a new forecourt has been created on the road side, a previous path connection was restored in the east. In this first urban mining project in Germany, the demolished annex was used as a source of raw materials. The aim was to reuse as much demolition material as possible in situ. In fact, 62 % was used as recycled mineral aggregate for the new building. 15 % of the demolished concrete was used to make the new concrete. The new annex is designed so that all construction materials can be homogeneously separated and also reused after the end of their life.

Facts

Design and construction: 2017–2022

Developer: Town of Korbach

Designers: Christian Thomann Architekt, Rheine; heimspiel architekten, Münster; agn Niederberghaus & Partner, Ibbenbüren

Size: 7,000 m²

Cost: €24.5 million

More information in the project description in the appendix on p. 121



BAUKULTUR AT A GLANCE

- Replacement new build in favour of the urban structure
- Incorporation of the historical existing building
- Use of the demolition material as an urban mine

40.5 m² per capita. The saving effect would be almost six times as much as banning all domestic flights within Germany. However, the current development is in decline.

Value of the Existing The major advantage of conversion projects lies in the fact that they can draw benefit from the Baukultur value of the existing building. And it was frequently large. Well into the 20th century, many companies placed importance on representative design, even for production facilities. Even everyday buildings were created with high-quality materials, which would hardly be possible to implement today. Conversion offers the opportunity to preserve these qualities. This is shown by the Haus der Jugend youth centre in Pforzheim. Modernised with a small budget, the simple post-war building impresses, among other things, with wall cladding made of natural stone slabs, which would hardly have been included in a new build budget.

Architectural qualities, however, cannot always be recognised at first glance. When the administration of the Flemish Kortrijk municipality set up its “Bürgerbüro” (citizens’ services office) in a bank building erected in the 1970s, suspended ceilings were removed. This incurred only very minor costs, but resulted in greater room height and disclosed the previously concealed qualities of the concrete structure.

Such measures can contribute to postponing or even preventing premature demolition. After all, in the population survey, 52 % answered yes when asked whether they had ever regretted the demolition of a building.

The redesign of a listed ensemble in Berlin-Charlottenburg shows that buildings with a difficult history can be transformed into attractive places by conversion, without negating the past. Grüntuch Ernst Architekten transformed a former women’s prison and the adjacent court building into a hotel.

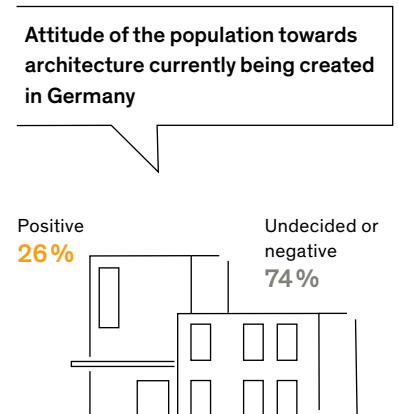
Functional deficits attributed to housing floorplans of the post-war decades can also be corrected by conversion. The separation of kitchen and eating area are now deemed to be impractical and is relinquished in favour of open-plan kitchen-living rooms. In this case, the alteration of non-loadbearing walls can give the existing building new quality.

In the modernisation of municipal housing stocks in the Spånga-Tensta district of Stockholm, the aim was to create rooms for new forms of living together. The old functionalistic structures were broken up, the housing units were given more open floorplans. Wood components were used to create apartment types of different sizes, which can be extended and made smaller again by adding and removing adjacent rooms.

In 2004, as a response to the policy of the French government, which provided billions for the demolition of large housing developments of the 1960s and 1970s, Frédéric Druot, Anne Lacaton and Jean-Philippe Vassal wrote the study *PLUS – les grands ensembles de logement (PLUS – the large housing estates)*. As a result, the trio of architects succeeded in transforming thousands of apartments, starting with the Tour Bois le Prêtre in Paris. Punctuated façades gave way to glazing to floor level and recessed balconies were installed in front of them as a climate envelope that extends the living space. As part of energy improvements, a completely new space impression was created almost en passant. The inexpensive measures, for which the apartments did not even have to be cleared, did not result in higher rents.

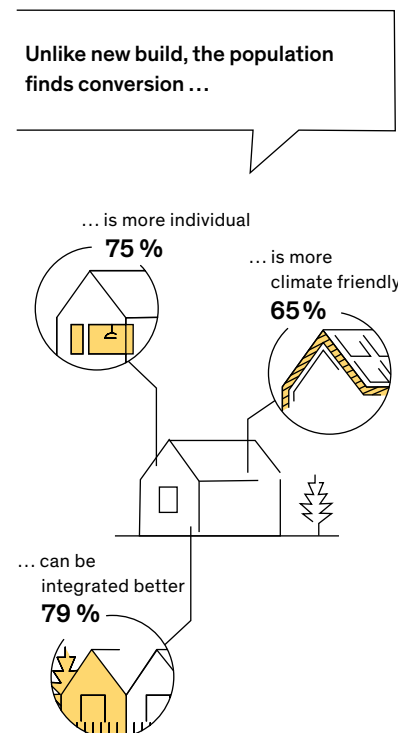
Appreciation of current architecture

Source: Population survey for the Baukultur Report 2022/23



High trust in conversion

Source: Population survey for the Baukultur Report 2022/23



A Baukultur of Conversion can make a contribution, not only for the structure per se, but also to the urban repair.

This becomes particularly clear in the conversion of former industrial areas. When the Essen Zollverein mine was adapted for new uses, a cultural landmark was created, which became the driver and symbol for the structural change of the whole Ruhr region. In many German cities, buildings of the industrial culture with their unusual spatial qualities are still the nuclei of the creative industry today.

The Limits of Conversion Retention and conversion are not a dogma. Examination of the existing fabric can also show that demolition is unavoidable. If a supporting structure is so damaged that there is a risk of collapse, demolition and replacement new build are necessary. The Rader Hochbrücke, a viaduct that has spanned Kiel Canal (North Sea-Baltic Sea Canal) since 1972, was so highly stressed that even the remedial measures of recent years only permit it to remain in service until a replacement structure is opened in 2029.

Contaminants can also force demolition. Most buildings erected, renovated or reshaped in the second half of the 20th century are contaminated. The Deutscher Abbruchverband (German Demolition Association) notes that such contamination should be assumed in every building erected during this period. In fact, according to an estimate of the German Environment Agency, 4.4 million tonnes of asbestos were used between 1950 and 1985. Until its ban in 1993, the carcinogenic material was mainly used in construction materials. Adhesives and sealants also contained harmful compounds such as polychlorinated biphenyls (PCB) and polycyclic aromatic hydrocarbons (PAH), while toxins such as the insecticide Lindan were added to wood preservatives.

Whether the users come into contact with the problematic material and are therefore exposed to a harmful effect depends on the installation situation. In the case of asbestos, there is no general remediation and removal requirement. Nevertheless, it is welcome if it is removed out of respect for future generations. Only in rare cases does this require demolition. The harmful substances must be removed properly before each demolition anyway – as a result of which, however, it is also possible to re-build on the raw building shell. Harmful substances can often be easily and permanently removed during a conversion.

If demolition is unavoidable, an attempt should be made to reduce the resulting quantity of waste by recycling or reuse. In the town of Korbach in Hessen, structural as well as functional and urban planning deficits tipped the scales in favour of the decision to demolish the extension to the town hall that had been erected in the 1970s. However, the demolition material was recycled as far as possible and used for a new building. Various research projects are aimed at recycling construction materials to an even greater extent. The standard for every demolition or dismantling must be to make it as compatible as possible, bearing in mind all ecological challenges.

Convertibility

Reusability Immense quantities of waste are produced by construction (see *Unrecognised Values* chapter). According to the Federal Statistics Office of Germany, 230.9 million tonnes of construction and demolition waste was produced

Baukultur Offers Youth Open Spaces

Wiesbaden Youth Centre in Signal Tower – The Potential of Forgotten Places



BAUKULTUR AT A GLANCE

- Conversion reveals potential
- Creation of a youth centre with minimum budget – in an existing building
- Involvement of the young people in the design
- Use of the supporting structure creates an unmistakable landmark
- Rough surfaces permit diverse occupancies

The signal tower on Holzstraße in Wiesbaden is the only relic from the west freight station. For years, Frank-Michael Feine, Chairman of the Centrum für aktivierende Stadtteilarbeit (CASA, Centre for Activating District Work), had lobbied the municipal authorities to transfer the building, which was defaced with graffiti and used only as a “billboard”, to his association for its youth support work. For Feine, it was the only chance to open a youth centre in the area. The association could not afford to buy a property and erect a new building. Donations had to be raised even for the low-budget conversion.

Out of ecological and economic conviction, the A-Z Architekten team gave the gutted signal tower a ventilated, thermally insulated wooden façade made of domestic spruce. It continued the façade of the flatter rear part of the building up to the height of the window spandrels of the signal tower. This created a terrace concealed from view on the renewed roof. All doors and windows on the ground floor have wooden folding shutters, which protect the building outside of opening hours.

Inside, all the old paint layers and broken-off edges of the gutting were left untreated. The furnishing made of OSB boards is as robust and minimal as the overall architecture: perfect for the young people who have an additional retreat with a panorama view in the signal tower.

The conversion, which was accompanied by intensive discussions, shows how a useless old building on the edge of the road can be re-anchored in the urban community with little effort and cost. The simple, wooden appearance of the youth centre did not survive for long. To prevent wild tags, the street art artist Manuel Gerullis was given the job of covering the outer skin with murals. These now unmistakably identify the signal tower as a landmark of youth culture.

Facts

Design and construction: 2018–2020
Size: 120 m²
Developer: CASA e. V. Centrum für aktivierende Stadtteilarbeit, Wiesbaden
Designers: A-Z Architekten, Wiesbaden;

KSP – Kuys + Spitzhorn Ingenieurgesellschaft, Wiesbaden
Cost: €350,000

More information in the project description in the appendix on p. 121



Baukultur Offers Youth Open Spaces Haus der Jugend Pforzheim – Upgrading of an Institution



BAUKULTUR AT A GLANCE

- Preservation of a place full of memories
- Adding an additional storey ends the lack of space
- Cost-saving extension through standard system
- Use of existing qualities
- Restructuring of the layout by removing internal walls



Almost every adult in Pforzheim knows the Haus der Jugend youth centre, has once played, learned and rocked there at some time or other. The Haus der Jugend – funded by the United States – was set up as an educational facility in the young post-war federal republic. In 1949, a flat building was created on the foundations of the Benckiser Villa that had been destroyed in the war, with large window fronts that refer to the adjacent park. Using the federal government's "Sanierung kommunaler Einrichtungen" (Renovation of municipal facilities) programme, the city not only managed to fund the necessary modernisation, but also an extension of the room allocation.

As an annex was out of the question in the listed park, adding an additional storey was the only option available to the VON M team of architects. However, the load reserves of the roof were not sufficient, so that new foundations had to be built for the new storey, independent of the old building's foundations, in the form of drilled micropiles. Steel columns, which penetrate the old roof level, carry the steel platform, which forms the basis of the added, inexpensive hall construction system. Folded perforated metal sheets envelope the new upper storey. The added structure is reduced visually by this dark grey curtain. The colour-adjusted old building with its

grid window fronts thus continues to characterise the landscape of the locality.

By demolishing several partition walls, a large hall was created on the ground floor: the heart of the building. It is lit naturally on both long sides. The stage, which stiffens the hall structurally, is in the middle of the room. Both sides can be performed on – for a larger or smaller audience. This allows for the programme variety. The stage remains open during everyday use of the building and allows the raised control room to be seen. On one side of it there are tabletop games; on the other there is a café.

Flexibility is one of the great strengths of this conversion. The size of the rooms on the upper storey, which are rented out for language courses and to dance groups, is variable. The finishing materials are hard-wearing without appearing cheap. Retaining the old Solnhofen tiles on the corridor walls required a certain effort, but with respect to the otherwise unaffordable quality of the material and the historical dimension of the building they add, it was worthwhile.

Facts

Design and construction: 2016–2019
Size: 1,453 m²
Developer: City of Pforzheim, building management
Designers: VON M, Stuttgart; Rainer Klein Ingenieurbüro für das Bauwesen, Sachsenheim; Kurz und Fischer

Beratende Ingenieure, Winnenden;
Ingenieurbüro Wörtz, Pforzheim
Cost: €4 million

More information in the project description in the appendix on p. 121

in Germany in 2019. Almost 60 % was soil and rock, the rest was gypsum-based building rubble and construction waste, broken out road material and construction site waste. This construction and demolition waste accounts for 55 % of all waste produced in Germany – according to the Federal Statistics Office of Germany – by far the largest share. Admittedly, 89.7 % of the mineral construction waste was recycled, however, much of it in the form of downcycling, in which the quality and usability of the initial material deteriorate. These materials are therefore mainly used in roadworks and earthworks.

A Baukultur of Conversion responds to the increasing scarcity of resources and significantly reduces the consumption of resources in construction by avoiding demolition and by handling the existing creatively and constructively. This was also demanded accordingly in 2019 by the Association of German Architects in its position paper *Das Haus der Erde* (Planet Home): “Architecture and planning must make do without new construction”.

Maintaining the existing building stock, however, can only reduce the waste quantities, not completely avoid them. Waste is also produced in conversions. The call to abolish all waste (*zero waste*), can only be met if a comprehensive circular economy is also introduced in the construction industry. In 2021, Berlin was the first federal state to issue an administrative regulation which stipulates mandatory reuse of all demolition material from public buildings.

Seen as a resource, construction waste could contribute a good part of the 550 tonnes of mineral raw materials used in Germany annually to manufacture construction materials. Experts also call this secondary raw material source an “anthropogenic stock”, which include all resources that have been incorporated in items of daily use. According to the German Environment Agency, around 55 % of this anthropogenic stock is apportioned to buildings and 44 % to transport and utility networks. Building services or consumer and capital goods, in contrast, account for less than 1%. The study by the Wuppertal Institute states that 15.2 billion tonnes of material are installed in Germany. Per person, this is a material stock of 185.8 tonnes, almost 60 % of which is stored in residential buildings.

If materials are (re)claimed from the anthropogenic stock, the process is called *urban mining*. With the logistics centre of a wholesale bakery in Zürich, a banal functional building erected in the 1980s was to become a cultural centre. To this end, the in situ firm of architects turned the usual design method on its head. Instead of materialising a plan as an architectural form, the design of the building follows the availability of materials and building elements from demolition sites.

One challenge in doing this is to dismantle building elements non-destructively, another lies in the distribution of the material. Even secondary construction materials can only be truly sustainable if they are not transported over long distances, but instead are used near the place where they are stored.

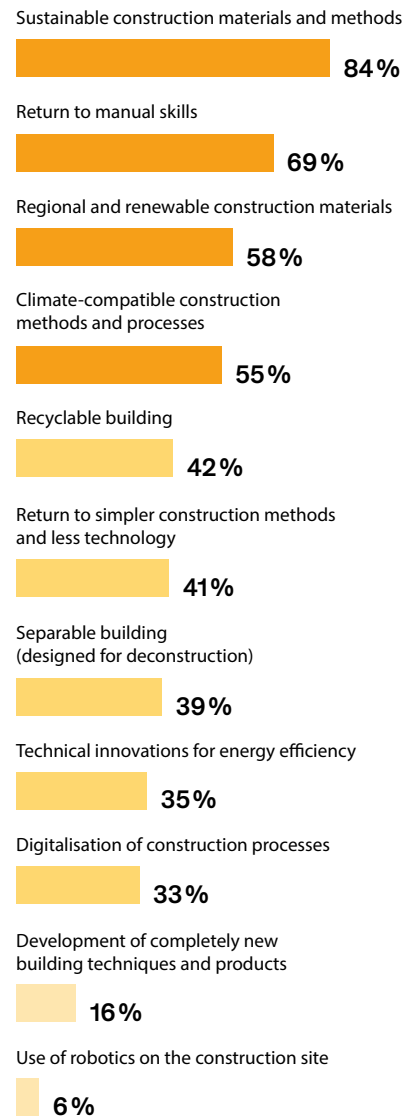
Material exchanges, such as SALZA, whose online offers are mainly aimed at private purchasers, have existed for a long time. Because the materials are advertised before they are demolished and are transported directly to the place of use, there is no need for storage. Anyone who registers the elements they need in advance is notified as soon as they are available.

Providers such as Restado and Concular, on the other hand, are mainly geared to architect firms and businesses. While Restado is a virtual marketplace for dismantled materials, at Concular the available components are listed in a

Skilled trade sees the future in sustainability and manual skills

Source: Survey of the trades for the Baukultur Report 2022/23

Particularly relevant for the construction sector in the next ten years:



Added Baukultur of Conversion value

Conversion as a comprehensive strategy for action to upgrade our living spaces

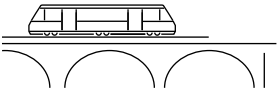
Sources: Allianz pro Schiene; ARGE 2022; BMDV 2022, 2021, 2019; FAZ 2020; IWU 2022; Statista 2022; Wuppertal Institut 2022

Stocktake of existing railway network

Deutsche Bahn owns
38,400 kilometres of rail



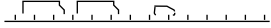
and 25,180 railway bridges



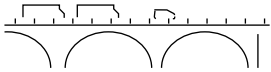
From 2019 to 2029, 2,000 bridges must be completely or partly renewed.

Stocktake of existing road network

In Germany there are 830,000 kilometres of roads



and 39,500 bridges on federal motorways and trunk roads



Only one in ten motorway bridges is in very good or good condition.

Stocktake of residential buildings

19.2 million residential buildings, which is 3.8 billion m² living space.



Detached house
66.7%



Semi-detached house
16.4%



Multifamily Dwelling
16.8%

More than half the residential buildings have been energy-efficiency renovated only slightly or not at all.

Stocktake of non-residential buildings

21 million non-residential buildings, of which...

Factories and workshops

1 million



Office buildings

350,000



Hotels and restaurants/bars

275,000



Trade and warehouse buildings

200,000



Sacred buildings

121,000



Company buildings

725,000



Other

3 million



Private garages

11 million



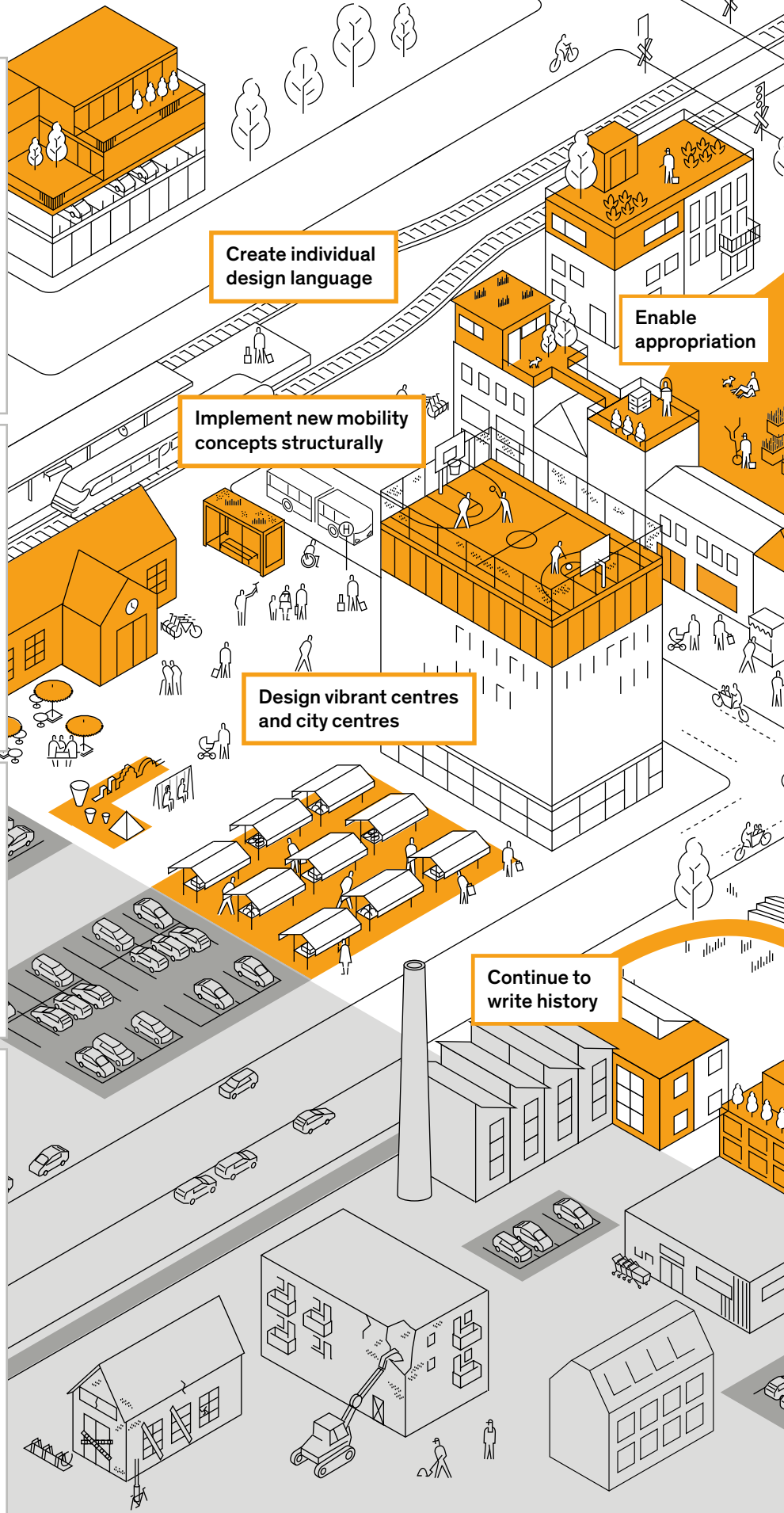
Agricultural buildings

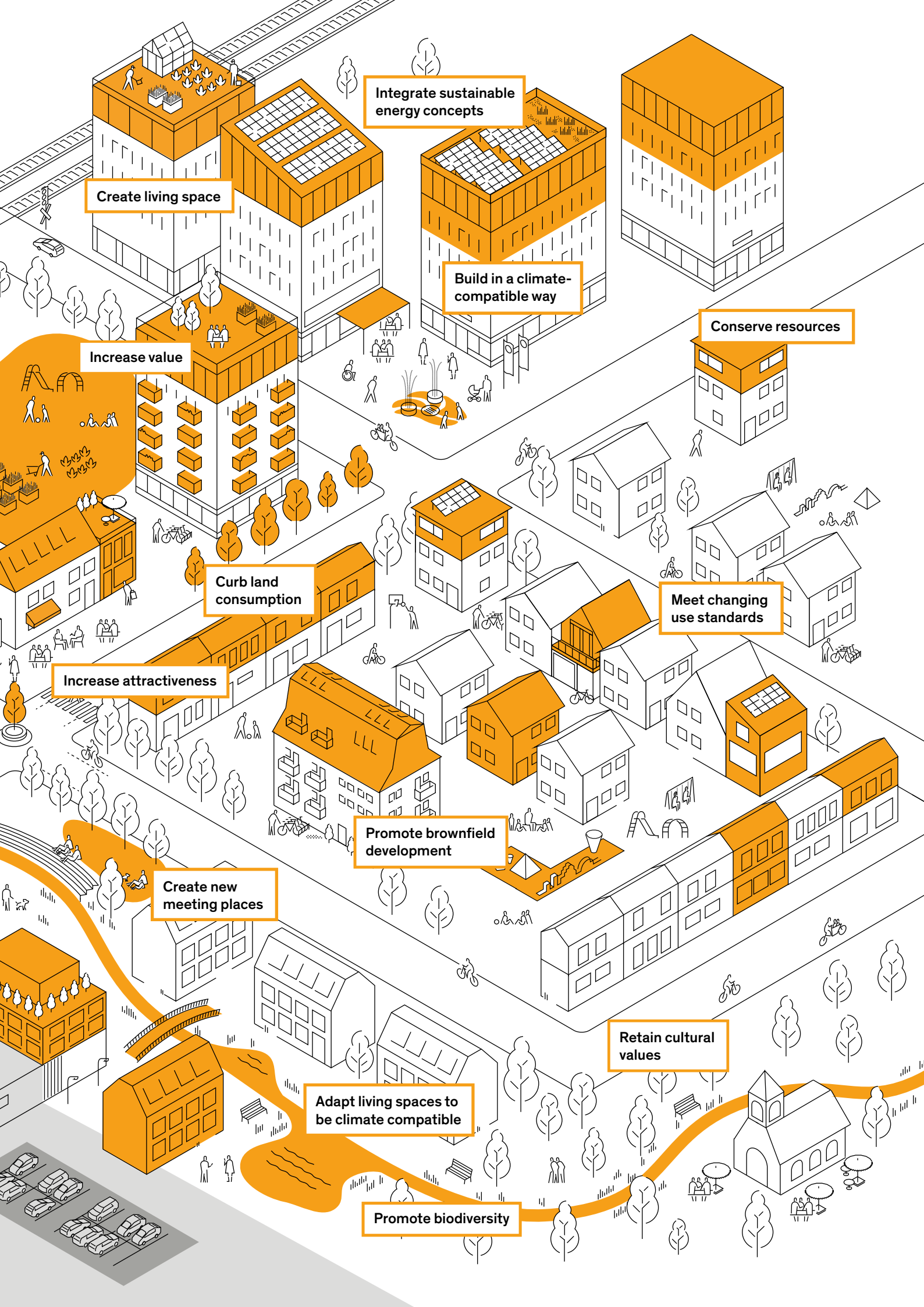
4 million



Institutional buildings

240,000





Integrate sustainable energy concepts

Create living space

Build in a climate-compatible way

Conserve resources

Increase value

Curb land consumption

Meet changing use standards

Increase attractiveness

Promote brownfield development

Create new meeting places

Retain cultural values

Adapt living spaces to be climate compatible

Promote biodiversity

material passport one year before demolition. In this way, the consultants find out which elements are available. If needed, demolition companies secure the required building elements for reuse.

The Madaster material register begins even earlier: Here a material passport is created for new buildings. Instead of mapping individual elements, it mainly lists material quantities. The residual raw material value can be calculated on the basis of a circularity index, which indicates the reusability of the component parts of a building, taking into account their origin and durability.

The German Environment Agency commissioned a research project to examine the establishment of a regionalised information management system. Not only were concepts for material registers developed, which take into account the existing structure stocks in a region, but also concepts for material inventories, which only apply to individual buildings.

Baukultur Considers the Whole Life Cycle

Südkreuz Core and Shell Building in Berlin – Anticipating the Conversion in the New Build

With the Südkreuz core and shell building (base build), a group of owners were awarded the site in the City of Berlin's Schöneberger Linse "concept procedure". The award process was decided according to social, ecological and urban planning criteria, in order to enable affordable housing in the city. In addition to 13 owner-occupied apartments and a guest apartment, the new building also has three units eligible for grants and areas for commercial uses, which are directed at the surrounding area. The core and shell buildings were developed by Praeger Richter Architekten. The first was created in 2014 in the Berlin district of Neukölln. The modular system offers groups of owners a robust framework within which the group members can implement their personal housing ideas for a reasonable price. It is also possible for the owners to carry out all or part of the finishing work themselves cost-effectively. In the seven-storey hybrid timber building on the Südkreuz site, the solid supporting structure designed for longevity is made of reinforced concrete. The highly insulated façades are a wooden frame construction with larch boards. The construction method improves the energy and CO₂ balance during construction, during the entire use phase and beyond: If modernisation is pending, the façade can be dismantled homogeneously. Renewable raw materials were also used for the interior fixtures and finishes. There are no composite materials, nothing is bonded or filled and smoothed. The members of the owner group were able to decide how far their apartment was to be finished for them. Anyone who carried out the drywall construction work themselves not only saved costs but could also personalise their own apartment. Because each core and shell building is also designed as a conversion building, the floorplans can be adjusted to changing conditions. The targeted use of construction materials according to their life cycle is intended to ensure that the solid core building endures – regardless of what pushes for modernisation may come in the future. Problematic building rubble is therefore avoided from the outset.

Facts

Design and construction: 2019–2022	Cost: €4.1 million gross (cost group 300 + 400)
Size: 2,200 m ² gross floor area	
Developer: Baugruppe Ausbauhaus	
Südkreuz, Berlin	More information in the project description in the appendix on p. 121
Architecture: Praeger Richter Architekten, Berlin	



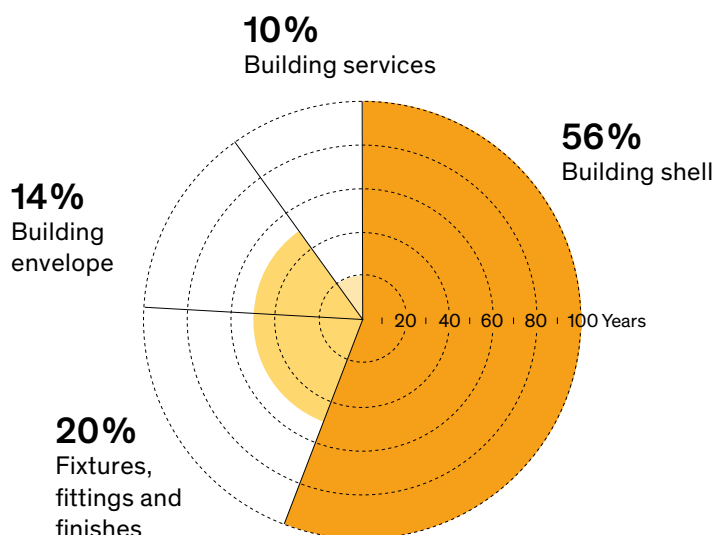
BAUKULTUR AT A GLANCE

- Core and shell (base build) system enables cost-effective housing
- Homogeneous separable building elements
- Consideration of life cycle aspects in the design

However, it is currently not yet less expensive to reuse construction material. This is due to changing construction processes and the need to treat and prepare the building elements. Liability and warranty are also still unsolved problems. The individual approval currently required is not only very expensive, but the *Wieder- und Weiterverwendung von Baukomponenten* (RE-USE of building components) study emphasises that under certain circumstances it is not necessary at all – for example, if used clay bricks are only used to brick up a non-loadbearing wall cladding. To reuse construction material on a broader basis, the reinstallation of secondary construction materials and elements, still made difficult by the standards and requirements, must be facilitated.

The most promising approach for maximising the life of buildings probably lies in farsighted planning, good design and high-quality execution of construction work. Instead of functionalistic solutions, which are designed for specific programs, it is necessary to create spaces which are readily suitable for a different use than originally planned. If structural adaptations are considered from the outset, the initial additional effort is rewarded during the course of the life cycle.

Changes in use, i.e. repurposing, should also be planned ahead in new build projects: in the floorplan structure, in the way in which building elements and construction materials are joined and combined, and also in the terms of the building services. Unlike the buildings of the modern age, residential and commercial buildings of the Gründer (from 1870) or Wilhelmine period (1980–1914) are deemed to be exemplary: Rooms that are arrayed behind non-loadbearing walls along a middle corridor and are connected to each other by side-hung doors are just as suitable for housing as for offices or medical practises and can be easily modified.



Life cycle and grey energy

Different building elements' grey energy share and their respective life expectancy

Sources: BNB 2017; Einfach Bauen 2021; Hegger/Fuchs/Stark/Zeumer 2007

The situation is similar for the industrial and storage buildings of the 19th and early 20th century. For example, in Hamburg, a former freight railway station is now the Oberhafen neighbourhood development, a creative industry location.

Where the architectural qualities are right, users are mostly prepared to overlook minor functional shortcomings.

Build Simply Climate change and scarce resources force us to scrutinise our endless striving for technical innovation. Simple, timeless buildings prove to be more environmentally compatible than high-tech architecture whose life is possibly short and which also promises energy savings which are hardly ever achieved in reality due to the performance gap (see *Conserve Grey Energy* chapter).

For a Baukultur of Conversion, it is important to design and build simply, because this facilitates subsequent adaptations and then these adaptations in turn can be executed as simple conversions. In order to achieve this, it is necessary to learn from the existing building stock and to recognise the advantages of robustness and simple usability, which characterise pre- and early modern building.

Baukultur is Robust

Research Houses in Bad Aibling – Build Simply

Three houses have been built in the Bavarian town of Bad Aibling, which not only have a traditional layout schooled by regional role models in common, but also their solid construction method. The buildings, one of each being built from timber, concrete and masonry, were erected as part of the “Simply Build” research project, which searches for sustainable alternatives to the increasing complexity in construction. The initial additional cost due to the high-quality construction method should pay for itself during the course of the life cycle: Robustness and ease of use prevent damage and reduce repair work and costs. The climatic inertia removes the need for mechanical ventilation and reduces the heating requirement. The fact that the supporting structure, envelope and building services are separated simplifies maintenance and allows non-destructive replacement of individual components. Timeless, well-proportioned rooms are intended to maximise the life of the buildings, while the simple wall construction makes modifications and attachments simple. If the houses are demolished at some time in the future, the building elements are joined so that the materials can be separated and reused. The boldness of the developer, a property group that recognised the opportunities offered by the project at an early stage, was decisive for the implementation. While further research buildings made of timber, mud and recycled materials are planned, the architects are designing three student halls of residence using simple construction methods on the university campus in Garching.

Facts

Design and construction: 2018–2020
 Developer: B&O Gruppe, Bad Aibling
 Designers: Florian Nagler Architekten;
 B&O Gruppe; merz kley partner; Transsolar
 KlimaEngineering; Horstmann + Berger;
 PH|plan; Forschungszentrum “Einfach
 Bauen” der Technischen Universität
 München

Size: 650 m² each
 Cost: 1,493 euros/m² (masonry
 construction); 1,730 euros/m² (timber
 construction); 2,039 euros/m² (concrete
 construction)

More information in the project description
 in the appendix on p. 122



BAUKULTUR AT A GLANCE

- Consideration of the life cycle in the design
- Simple, robust construction method creates longevity
- Private developer enables research project

A solid construction method not only offers more thermal storage mass with regard to thermal insulation than a thermal insulation composite system (TICS), it is also less susceptible to mechanical damage. In addition, the renovation expenditure is reduced because there is no need for periodic replacement of insulation materials. According to the “Bewertungssystem Nachhaltiges Bauen” (sustainable building assessment system), this can be necessary every 40 years with a TICS.

Building with solid, high-quality materials admittedly means higher initial investments but pays over the life cycle – all the more so when it is accompanied by timeless architecture. However, to achieve this, it is imperative not to maximise short-term yield expectations.

Simple building prioritises architectural means over technical solutions. This also simplifies maintenance elsewhere: Walls with deep reveals mean more effort during construction but make movable and therefore maintenance-intensive shading elements unnecessary. Building services systems are often complex to operate. Easy to use, intuitive solutions on the other hand make the everyday life of the people in the building easier. Damage caused by improper use is also rarer.

Where building services are unavoidable, they should remain separate from the structure and finishes, so that they can be maintained and replaced non-destructively. The Technische Universität München conducted research into the life cycles of different building components in three experimental buildings in the Upper Bavarian town of Bad Aibling: While a life of 50 years is assumed for the envelope, the structure in which most of the grey energy is stored should stand for 100 years. Replacement of the technical systems can be expected every 20 years, a change in room use every ten years.

A simple construction method, in which these components are uncoupled, allows them to be modified independently of each other. If the building erected in this way nonetheless has to be dismantled, the construction materials can be reused more easily, because their number is limited and there are no extensive surface connections or bonds. The result: construction materials and elements can be separated homogeneously and easily recycled.

In simple building, the building elements are joined in an uncomplicated way. This means that even inexperienced people can manage to carry out minor interventions. This reduces the number of personnel needed for maintenance – an advantage that is a major cost factor in times of skilled personnel shortages.

Manual Skills Despite all the abstract planning and administrative steps that building demands, it is ultimately about real built results. The role of the skilled trades is correspondingly essential. The shortage of skilled personnel has stood in the way of many goals of the construction industry – such as the renovation rate, housing construction and climate neutrality. In 2021, 33.5 % of all companies in the building sector reported that they did not have enough skilled personnel. In civil engineering the figure was 37.4 %. The lack of apprentices in the building trades is similarly high: In 2020, 30.7 % of all training positions in the concreting and reinforced concrete trade were unfilled, in plumbing businesses the figure was 41.1 %.

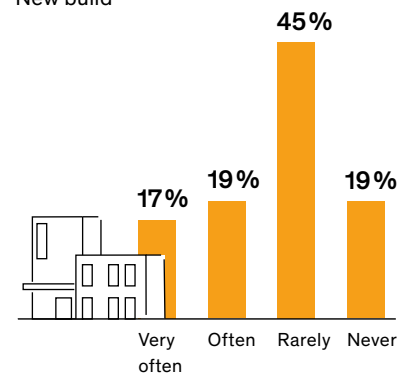
A Baukultur of Conversion could make skilled trades attractive to young people once more. A skilled trades survey conducted together with the German

Skilled trades can have more design input in conversion

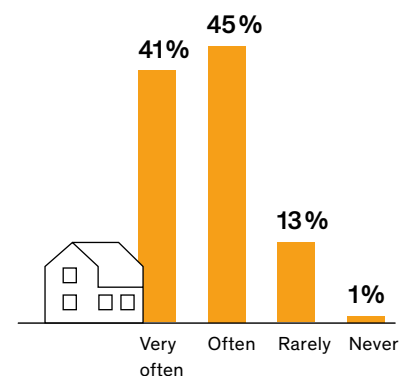
Source: Survey of the trades for the Baukultur Report 2022/23

How often are you involved in design decisions on the construction site or in advance?

New build



In conversion/renovation



Design wish of the skilled trades

78% of the skilled trade firms surveyed would like to be more frequently involved in issues concerning design and material selection.

T 10

Confederation of Skilled Crafts (ZDH) found that while 86 % of the firms are frequently or very frequently involved in the design of conversions, in new build it is far rarer, at only 35 %. The appreciation demonstrated by the increased participation could well be a reason why 78 % of the skilled trades firms prefer conversions and renovations to new build projects.

In fact, conversion is more individual and requires more ability and improvisational skill of the trades than the routine task of new build. Work rapport/identification and economic reasons are positive aspects of a skilled trade career. Our sensorimotor skills also point in this direction. One third of the areas of the cerebral cortex responsible for motor skills controls the hands and fingers. This is clearly illustrated by the motor homunculus: This neuroanatomical topographic representation has a large mouth – and enormous hands, which constitute one third of the body.

Tasks that extend beyond the mere assembly of industrial building products also restore the feeling in skilled trades personnel of having greater self-efficacy. In the survey of the skilled trades, 69 % of the firms were convinced that a return to manual skills is relevant for the construction sector. The interaction of traditional techniques and new possibilities (such as through automation or laser-assisted measurement of works) could also make digital natives enthusiastic about the skilled trades.

Prefabrication in factories, on the other hand, opens up the opportunity for older personnel to no longer have to continuously expose themselves to the changing physical efforts on the construction site in all types of weather.

Baukultur is important to the skilled trades

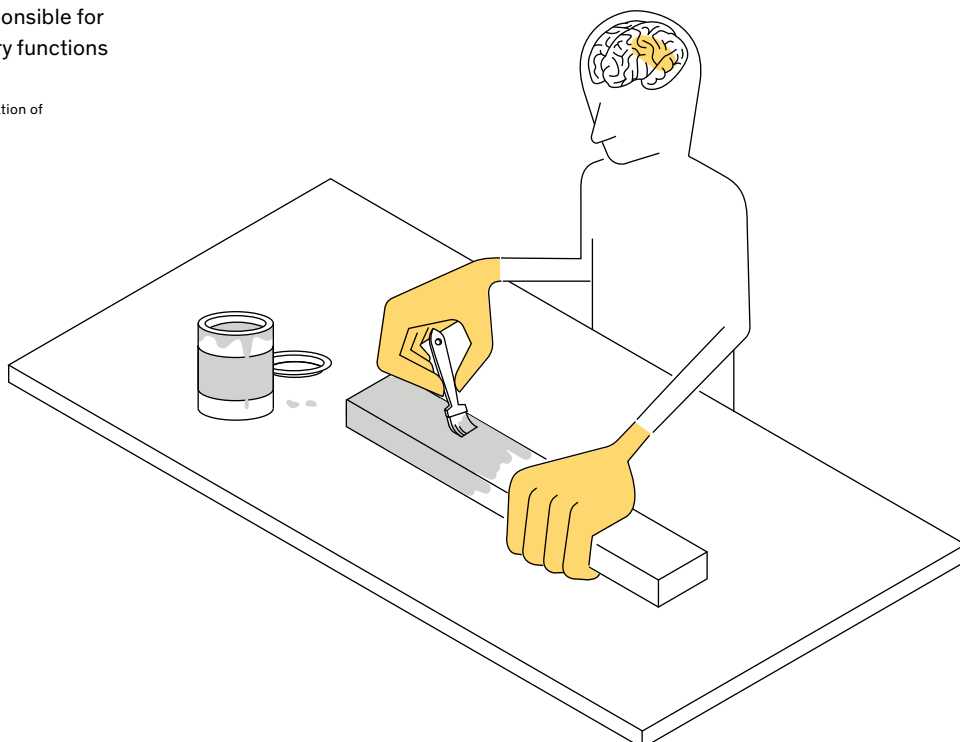
89 % of the skilled trade firms surveyed stated that it is important or very important to them to contribute to a well-designed building/structure with high Baukultur value.



So much brainpower lies in the hands

A third of the brain area responsible for the body's motor and sensory functions is needed for the hands.

Source: Illustration by the Federal Foundation of Baukultur based on Penfield/Rasmussen



DIY stores now not only offer equipment to hire but also training courses for all those who enjoy DIY work. The self-confidence of amateurs makes up for their lack of knowledge: Asked for a self-assessment in 2019, 24 % stated that they are manually skilled while the remaining 76 % said that they at least got by. The professionals were far more self-critical. 33 % described themselves as skilled, but only 50 % declared that they got by, while 13 % answered “so so”.

A muscle mortgage, in which one’s own work replaces part of the owner’s equity, is also still an option, especially for conversions. It is mainly interior construction measures, which can save an average 10 % of the building costs. Not only financing gaps can be closed in this way. Personal attachment to the own home is also stronger.

The skilled trades endorse homogeneous separation

94 % of the skilled trade firms surveyed think that it makes sense to use homogeneous construction materials and to ensure subsequent separability, in order to also make conversions or even demolitions easier and enable the reuse of building elements. **T10**

Muscle mortgage, mainly in rural areas and among younger people

In towns with fewer than 5,000 inhabitants (62 %) and at a young age, the term “conversion” is more frequently associated with projects in which the occupants lend a helping hand. **P1**

Baukultur Introduces Individuality into Modular Construction Luisenblock West – Sustainable and High-Quality – On Schedule and On Budget

With the Luisenblock West office building in the Berlin government district, a bidding consortium of Sauerbruch Hutton Architekten, Kaufmann Bausysteme and Primus Developments demonstrated the advantages of modular building with timber. In order to quickly create new offices for the Bundestag, Germany’s parliament, 400 offices were built under the direction of the Bundesamt für Bauwesen und Raumordnung (BBR, German Federal Office for Building and Regional Planning). The building, made up of 460 prefabricated solid timber modules, was built in only 15 months. The method of construction enables the building to be extended or reduced at a later date and for the modules to be removed and set up again in another place. The optimised design processes of modular building enabled the budget to be met. The building was even completed before the deadline expired. Construction of a one-to-one scale module mock-up was started in HOAI phase 2 of the design process, based on which, after the building permit had been issued, the design and fitout, fixtures and fittings were agreed. The modules were 85 % prefabricated: Carpets, electrical cables, doors, sun and anti-glare protection and lights were installed in the factory. The short transport routes within Berlin supported the sustainable approach of the project. The ground slab, the plant rooms on the ground floor and the atrium, which is located at the centre of the H-shaped floorplan, were made of reinforced concrete. Timber was used in all other areas. The project development company replanted the same number of trees that were felled for the project. The colour concept of the façade made of recycled aluminium and glass lends the building individuality and an attractive appearance.

Facts

Design and construction: 2020–2021
Developer: Deutscher Bundestag
Designers: Sauerbruch Hutton, Berlin;
Kaufmann Bausysteme, Reuthe/
Österreich; Primus Developments,
Hamburg; Wetzels & von Seht, Hamburg

Size: 17,100 m² GFA
Cost: €70 million

More information in the project description
in the appendix on p. 122



BAUKULTUR AT A GLANCE

- Modular, serial building
- Climate-friendly timber construction
- Short building period thanks to off-site production
- High design value
- Convertible

Conversion – Rethinking

Until now, training, legislation and practice in the construction sector were focused on new build. Most property and construction industry business models also allow larger profits in new build. This makes conversion difficult and leads to greater bureaucratic effort. Planners and designers have also had a penchant for new build projects for prestige reasons. Objective reasons and social trends suggest that it is time for a rethink: Sufficiency is increasingly not seen as sacrifice but as quality. Responsible building begins with the requirements planning, bears operation and maintenance in mind and ensures flexibility and adaptability. Sustainability, future viability and longevity go hand in hand – and are the guiding principles of a new Baukultur of Conversion.

The poor reputation of conversion

Over half the population views the conversion of buildings to be more complicated (67%) and more expensive (59%) than their new build. **P11**

Financial Framework

Real Costs The unforeseen pervades conversion. Many therefore believe that it must always be more expensive than demolition and new build. In fact, the opposite is often the case. In the conversion of the Gymnasium Goetheschule grammar school in Hanover, part of the existing building was retained. The costs were therefore lower than those of a comparable new building. The school can also continue to use its old assembly hall, which – in this form and with such a large stage – would hardly have found a place in a modern day room allocation.

In many conversion projects, the survey of the existing building before the project starts is limited to geometries. This helps to precisely describe the spatial planning, but it does not add anything to cost certainty. Thorough examination of the building's condition is essential to determine the effort that is needed and take it into consideration in the time schedule and tendering (see *Phase Zero and Phase Ten* chapter).

This knowledge of the existing building and the wishes of the clients can then be used to draw up an initial cost estimate in the preliminary planning, which must be far more detailed for conversion projects than for a new build. In new build, the cost estimate is based on the square metre prices. For a conversion it is more differentiated and broken down into measures such as demolition, securing, repair or technical renewals and then supplemented to include costs for annexes or extensions. Because this is more complex and elaborate, a conversion cost estimate requires more working time. The HOAI allows for a conversion surcharge as compensation.

The fee scale (in Sec. 2 (7) and Sec. 4 (3)) also adds the technical or design value of building fabric that is used to the attributable costs, which are in turn decisive for determining the design fees. This is intended to prevent designers from being financially disadvantaged if they include the existing fabric. Work such as contamination investigations or surveys, which are necessary for a realistic appraisal of the costs, must be commissioned and paid for separately.

A careful survey is one way to reduce conversion costs, another is the willingness of those who want to build to accept more sufficiency. By not expecting new build standard as the measure of what is acceptable, priorities can be set

and thus costs saved. The construction project then follows the principles of “what is old remains old” and develops its qualities from a partial intervention. How this is done is shown by the relocation of Berlin’s Ernst Busch Academy of Dramatic Arts. To this end, the architects, Ortner & Ortner Baukunst, extended an old building erected in the 1950s. The existing fabric was only treated up to a height of 2.30 metres; everything above that height, including the ceiling, remained in its raw condition. The interaction between old and new created a new design language. Sufficiency here is not a sacrifice, but instead involves focussing on the basics and the quality that arises from them.

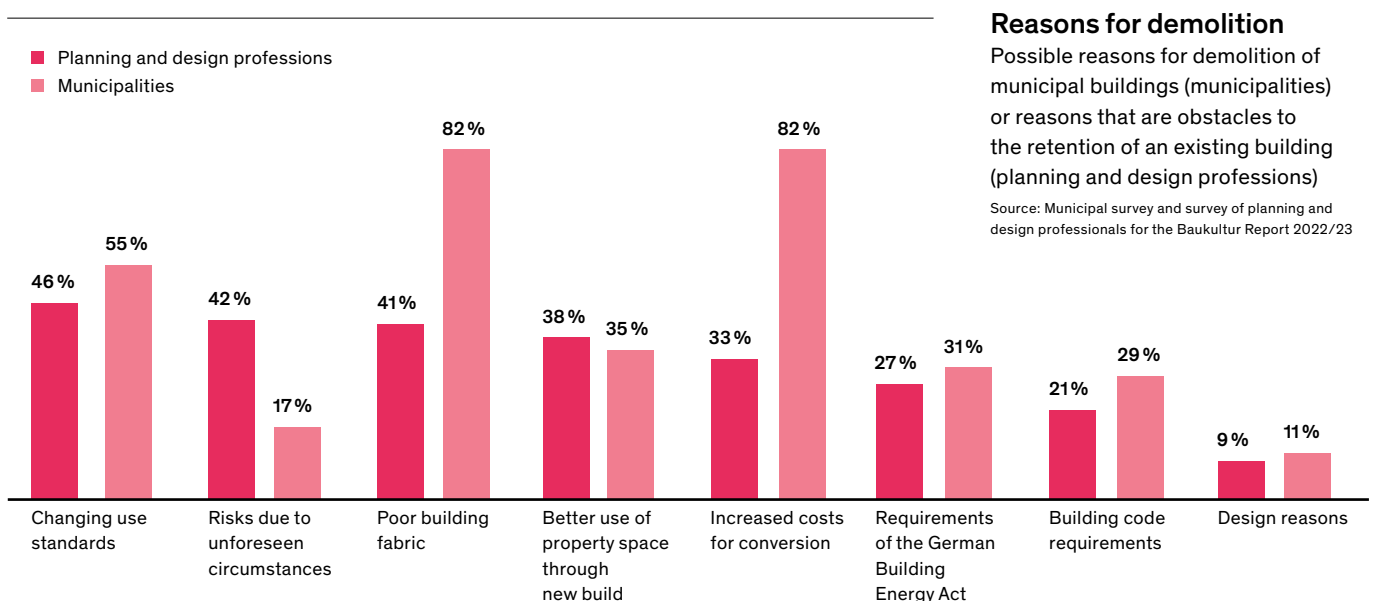
Municipalities benefit most of all where whole settlements are converted directly. The new build of neighbourhoods means incurring costs for site development (providing roads and utilities), open spaces and other infrastructure, costs that are not necessary for a conversion. These financial resources can be used elsewhere. What is more, no additional land is sealed. Before designating new areas of land, it is therefore always necessary to thoroughly examine the potential offered by compartmentalised redensification.

Similarly, it seems logical that the conversion of a building is also more favourable than its demolition and replacement with a new building. After all, the material is already on site, the supporting structure already built and complete demolition is superfluous. Yet in general, neither the grey energy captured in the building fabric nor the transport and disposal of materials are included in an alternative assessment.

To date, emissions from the production of construction materials have been attributed to the industry that manufactures them. The life cycle assessments of buildings are therefore in most cases only calculated with the energy demand for construction and operation. CO₂ pricing also begins with the operation of buildings: In 2021, the emission of carbon dioxide by traffic and buildings was officially priced for the first time. This price takes into account emissions from the combustion of heating oil, gas or coal to generate heat in buildings and in industry. CO₂ pricing is a component of the federal government’s building renovation strategy: Higher energy costs are intended to be an incentive to improve the existing building.

Retention of existing stock is often not provided for

42 % of the designers asked state that the wishes of the owner/developer or the requirements defined in calls for tender/competitions are often an obstacle to the retention of an existing building. 



Structure costs are defined as the sum of the production (construction) costs and the incidental building costs. On the other hand, life cycle costs also include the costs for operation, maintenance, the replacement of elements and even for the dismantling. If these factors are ignored, the decision is often made in favour of cheaper construction methods and materials – even if they entail high follow-up (life cycle) costs during operation. Savings made here have far-reaching consequences. In the current surveys by the Federal Foundation of Baukultur, both municipalities and design professionals consider poor building fabric to be a frequent reason for demolition. It also does not pay to reduce design services in the early phases. The design process influences more than 90 % of the life cycle costs – of which, on average, the design costs themselves account for only 3 %.

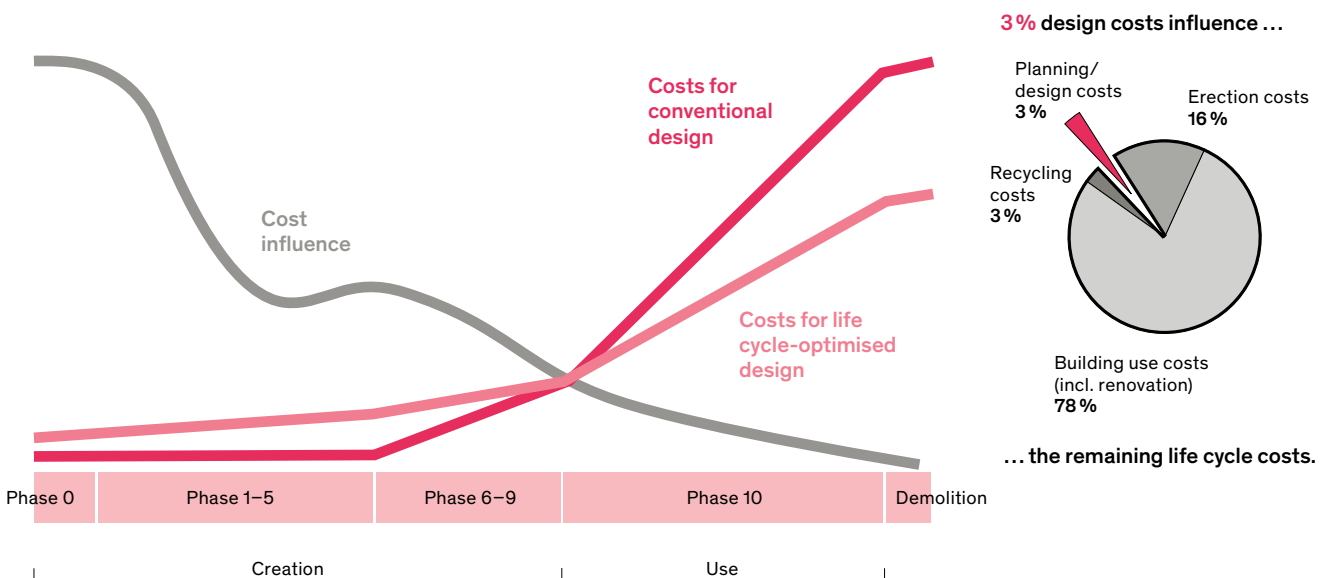
Operating costs, health and sustainability aspects are becoming increasingly relevant for a property valuation. Certificates can ensure more transparency. Since July 2021, the Qualitätssiegel Nachhaltiges Gebäude (QNG, sustainable building quality seal) has been introduced successively with “Plus” and “Premium” levels. It is also intended to serve as a legal basis for the award of public funds: The classification, which is based on a life cycle consideration, is a requirement for bonuses that the Bundesförderung für effiziente Gebäude (BEG, German Federal Funding for Efficient Buildings) grants for buildings with a sustainability class (NH).

The seal is not awarded until the sustainability of a project has been confirmed – in one of the registered assessment systems (to date DGNB, NaWoh, BNK and BNB) and in a quality audit conducted by an accredited certification body. In addition, the project must meet “particular requirements”, which the

The design work is decisive!

The design work, especially during the early service phases, influences the total life cycle costs.

Sources: Federal Foundation of Baukultur based on Jones Lang LaSalle 2008; Rotermund Ingenieure 2022



then German Federal Ministry of the Interior, for Building and Community (BMI) defined for “Contaminant avoidance”, “Accessibility”, “Sustainable production” and “Greenhouse gas and primary energy”. The energy balance is no longer the only standard used, low emissions are now taken into account as well: Upper limits for greenhouse gas emissions during the life cycle ensure that grey emissions are also considered. A separate certificate for existing buildings is in preparation.

The existing building stock is thus shifting into the focus of the property industry. According to a survey of German investment companies conducted at the end of 2021, 90 % of them planned to invest just as much or more than before in the existing stock in the future. This is also attributable to the European Union funding according to ESG conformity. ESG stands for *Environmental, Social and Governance* investment and means environmentally aware, socially responsible business management. It means the voluntary commitment of companies to operate sustainably.

In its “Action plan for financing sustainable growth” of 2018, the EU Commission set the goal of steering capital flows on the capital market into sustainable activities. Agencies now offer ESG ratings, which attest that and to what extent companies meet the necessary criteria. The classification system of these ratings includes the new build of properties, their purpose and renovation measures in equal measure. In addition to questions on topics such as health, employees, risk management and corruption, property companies must also answer specific questions on climate protection measures in buildings (such as photovoltaic systems), on investments in achieving environmental goals (such as energy-efficient renovations) and on their share of the whole portfolio. Building owners who act in a climate-aware way become more attractive for investors – and profit from it. This is also reflected in the survey: two thirds of the investment companies plan to optimise their existing buildings in the near term in accordance with the corporate social responsibility of the ESG criteria.

Especially for commercial properties, an unsustainable property is inconceivable as an investment for most companies because higher costs and even vacancy loom due to more stringent laws. The Federal Foundation of Baukultur, together with the Institut für Corporate Governance in der deutschen Immobilienwirtschaft (ICG, Institute for Corporate Governance in the German Real Estate Industry), has drawn up the “*Kodex for Baukultur*”, a “Code for Baukultur”, which property companies can use to take an appreciative approach to handling the existing stock and its contextual development. However, appealing to the industry’s sense of responsibility will not suffice. The financial assessment criteria must also be changed, as already initiated on the European level, for example, with the sustainable finance disclosure regulation and the taxonomy regulation. New build only seems more favourable to date because rates of return are charged on an individualised basis, whereas costs for environmental impacts or energy use are charged to the community collectively. A Baukultur of Conversion needs a transparent, honest cost and benefit analysis, which includes all parameters.

Tax Advantages Politics and policymakers have already used tax law as an incentive in the past. The motivation for this varies greatly. It ranges from socio-political objectives such as helping families to purchase their own home

(Section 10e Einkommensteuergesetz, EStG (German Income Tax Law)) to ecological and housing policy considerations. Regulations such as “Denkmalabschreibung”, accelerated depreciation of listed buildings, have been part of tax law for many years (Sections 7i and 10f EStG). However, these policies also set deadlines to motivate target groups to take the required measures quickly and therefore save on the tax they pay. For example, (according to Section 35a EStG) households can deduct the cost of repairs and work by skilled trades from their yearly income tax up to an upper limit. Anyone who lets an apartment can offset acquisition costs and maintenance measures for a building against tax.

Differences also result from the age and status of a building. Heritage buildings, the renovation of existing buildings as well as new build apartments are funded. Retaining heritage buildings is given particular attention in tax law in order to at least partly cushion the financial burdens involved, which can be immense. There is the accelerated depreciation of heritage buildings under income tax law, a deduction under the Grundsteuergesetz (land tax act), and the Erbschaftsteuer- und Schenkungsteuergesetz (capital transfer tax law) also benefits heritage buildings. The general depreciation rules, which were degressive in some years in order to stimulate more new build, apply to new buildings.

On the other hand, little attention has been paid over the years to the renewal of the non-listed building stock. Only recently, against the background of the housing initiative and the discussion of energy-efficient renovation, have the legislative bodies created possibilities for tax incentives to promote extensions and renovation. For example, a special depreciation (under Section 7b EStG) is intended to promote the construction of new rental housing. It applied to apartments for which the planning application or building notice had been submitted by 31 December 2021. It not only covered the new build of apartments; conversions and extensions also benefited if new housing space was created (for example, on the attic storey or by adding additional storeys). The effectiveness of this provision is still being evaluated. However, extension of the scheme is already being discussed.

The tax relief for energy-efficient renovation of owner-occupied housing at least ten years old (under Section 35c EStG) especially targets the existing housing stock. It promotes the thermal insulation of walls and roofs, the renewal of windows, external doors and heating systems, and other measures. The provision was introduced into taxation law with the law implementing the Climate Action Programme 2030. It creates a double incentive – through tax savings and reductions in energy costs. The federal government expects to receive around 235 million euros less in taxes as a result – a sum that therefore benefits owners willing to renovate.

With all these measures, policymakers want to support conversion of the existing building stock. Whether it succeeds remains to be seen. Do the provisions actually achieve the desired success? Or do they merely initiate bandwagon effects on people who are willing to renovate anyway? The effort required of citizens is also decisive. In practice, some of the bureaucratic requirements are high, specialist certificates and proofs are demanded, so that the tax offices can check the facts without having the knowledge of building experts. All the more urgent, therefore, for the financial administration to publish implementing regulations for the law, to make it more user-friendly.

How such tax incentives affect Baukultur has hardly been studied. Whether a renovation or the addition of storeys is accompanied by quality design is not taken into consideration. If ageing wooden windows are replaced with inexpensive PVC windows, it may well meet the renovation requirements in purely legal terms. But it does not provide any added value for Baukultur – on the contrary. This also applies to wall insulation, which often changes the overall appearance of a building to its detriment. Also disregarded to date is whether, on balance, emissions are actually saved – because factors later in the life cycle (such as the disposal of construction materials that are no longer needed) are not considered.

To avoid misguided or ineffective incentives, in future it will be necessary to weigh up between direct grants and tax relief and precisely consider what is to be encouraged. Quality targets should also be given greater consideration in renovation projects. A feasible solution would be tax concessions along the lines of the provisions for heritage buildings. In practice, however, low threshold, direct funding offers should be easier to implement.

Create Incentives In 2021, several energy efficiency funding programmes were merged into the Bundesförderung für effiziente Gebäude (BEG, Federal Funding for Efficient Buildings): Grants are given by the Bundesamt für Wirtschaft und Ausfuhrkontrolle (BAFA, Federal Office for Economic Affairs and Export Control) and the KfW bank gives loans. In the third quarter of 2021, 72 % of all funds granted were for renovations. The situation is different if only the systemic measures in housing construction are considered, which are for qualification as an efficiency house in accordance with the “BEG WG” subprogramme: 87 % of the funds awarded there benefited new buildings.

More than three quarters of these projects had an efficiency house 55 as their goal, which is long since the standard – an undesirable development. The funds for energy-efficient new buildings and for renovations were therefore suspended in January 2022. The EH-55 funding for new buildings has been permanently removed. However, renovations continue to be supported in line with the energy standards 40/55/70/85/100. The funding is granted for improvements to the building envelope, optimisation of the building services, energy design and construction advice and support, and the conversion of non-residential to residential buildings.

In order for them to really benefit the climate transition, in future, funds must no longer be linked to energy standards only; after all, energy consumption only allows conditional conclusions to be drawn about CO₂ emissions. In January 2023, the “Klimafreundliches Bauen” (climate friendly building) programme will replace the funding measures for new buildings to date and financial support will therefore be based on greenhouse gas emissions per square metre of living space. To save grey emissions and therefore reduce the emission of greenhouse gases, the upgrading of the existing building stock should be given greater support in a revised version of the BEG.

The federal states and municipalities also support building in existing fabric. The municipal “Jung kauft Alt” (Young buys old) programme in the East-Westphalian town of Hiddenhausen is intended to make it easier for young people to purchase a home from the existing stock. To reduce risks, the financing is initially supported by a report on the condition of the building. A subsequent purchase of the house, which must be at least 25 years old, is supported over six years.

Wish for support for conversion

86 % of the population are in favour of greater support for conversion measures.

P11

Visual redesign of the housing situation as an incentive for renovation

More than half the population (53 %) would like to change their own housing situation through a visual redesign. P2

There are also grants for renovation. As young families opt for old buildings in evolved structures instead of for a new build on the edge of town, the funding promotes brownfield development at the same time – and is now applied in 119 small municipalities throughout Germany. The programme, originally intended to combat vacant properties, could become the blue phase for general conversion funding: Its obligatory building survey removes barriers and can smooth the way for a Baukultur of Conversion.

To avoid bad investments, the application procedure for private persons must become simpler and the advice they receive more comprehensive: In fact, the KfW bank offers to draw up individual renovation road maps. But it is important to combine the energy efficiency advice with design recommendations. An energy-efficient renovation is a rational matter, which does not tend to instil enthusiasm in either self-users or tenants. The discussions – like the communication regarding the funding – are outweighed by cost-benefit considerations. Especially among older people, who live in their own house, the willingness to renovate and their financial means are often limited.

The Federal Chamber of German Architects has therefore pointed out the opportunity to combine energy-efficient renovations with more attractive measures, which directly increase living comfort and modern conveniences. These could be the addition of storeys or balconies, or age-appropriate conversions to improve accessibility. The Federal Foundation of Baukultur currently sees an increase in living quality as an important motive for renovating buildings and upgrading them in Baukultur terms. The *Mit Freude sanieren* (Enjoy Renovating) manual contains many and varied good reasons and examples.

Other incentives could be quality seals and certificates, which increase the property value. The most well-known schemes in Germany are the certification of the Deutsche Gesellschaft für nachhaltiges Bauen (DGNB, German Sustainable Building Council) and the “Bewertungssystem Nachhaltiges Bauen für Bundesgebäude” (BNB, Sustainable building assessment system for federal buildings) developed by the federal government together with the DGNB. The DGNB considers ecological, economic, sociocultural and functional, technical and procedural aspects of sustainability of the whole life cycle. The location quality is also evaluated. The DGNB has drawn up its own list of criteria for renovated existing buildings and has added the “Bronze” certification level for exemplary existing buildings. It is issued from 35 % compliance.

The BNB is mainly used to evaluate construction projects of the federal government. In addition to the “New build” and “Use and Operation” assessment modules, there is a “Complete modernisation” module, however, it closely follows the new build criteria. Earlier material flows and environmental effects – i.e. including the grey emissions – remain “outside the balancing area“. Specific assessment options for heritage buildings should reflect their sociocultural importance.

Alternative assessment systems could better cater to the peculiarities of the existing building stock. For the conversion of the Fürstenfeldbruck airfield, the Muck Petzet architects engaged by the town developed the “Bewertung Bestehender Bauten” (BBB, assessment of existing buildings) as a decision-making aid. The tool allows the comparison of the life cycle forecasts for different scenarios: Retention of the existing building, conversion and replacement new build.

The “Kulturerbe Konstruktion” (Construction Cultural Heritage) priority programme supported by the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) uses a similar approach. In the “Ganzheitliche Bewertung stählerner Bahnbrücken” (Integrated assessment of steel railway bridges) sub-project, an assessment system is being developed in which, alongside engineering and economic efficiency, ecology and Baukultur are also criteria.

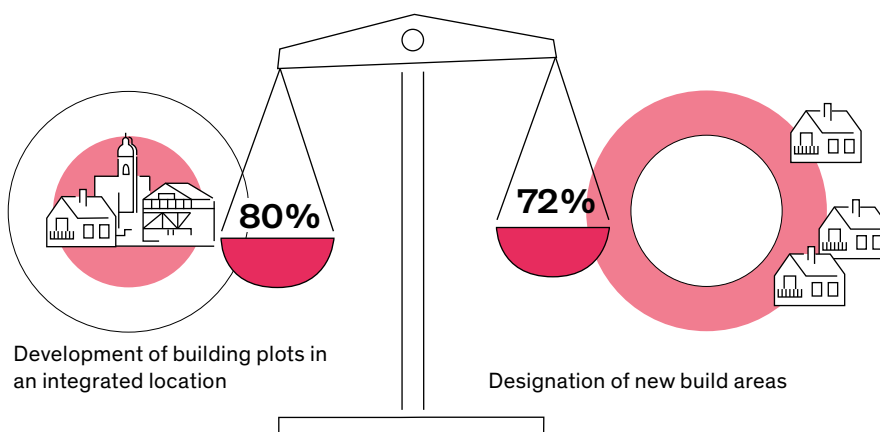
Not least, the Baukultur of Conversion needs models: Much-discussed projects and own awards and prizes for building in existing fabric could provide impetus. Nicole Razavi, Baden-Württemberg Minister for State Development and Housing, explained that in future, her state’s prize for Baukultur is to be considered a “State Baukultur of Conversion Prize”.

Legal Framework

Land Policy Land is a non-reproducible asset. It plays a key role in the development of towns and cities. Having access to land gives municipalities the opportunity to create price-controlled housing, restructure traffic sustainably and redevelop the municipality to be climate resilient. However, for a long time, municipalities were more likely to sell land to cover budget deficits than to buy and develop it. Admittedly, a rethink has occurred in this area but sharply increased prices now make it difficult to purchase or buy back land areas.

The City of Ulm has operated a farsighted policy of land stockpiling for years. Land is bought up in order to use or swap it later. Moreover, local development plan procedures are only started for land that belongs to the city. Properties that the city sells to construction finance companies or private persons may not be sold on – unless they are sold back to the city at the original selling price. Whoever builds on new land must offer 30 % of the resulting apartments at a socially acceptable price. Through its land stockpiling, Ulm now has control of one third of the city’s land and is a model for many cities.

The municipalities surveyed stated their planning and building objectives as:



No clear priority for brownfield development

Source: Municipal survey for the Baukultur Report 2022/23

The “Bündnis Bodenwende” (Land Use Transition Alliance – a coalition of academics, chambers, associations and foundations) and the “Bodenpolitische Agenda 2020–2030” (Land Policy Agenda 2020–2030 – an initiative of the German Institute of Urban Affairs and the Bundesverband für Wohnen und Stadtentwicklung (VHW, Federal Association for Housing and Urban Development)) have given a voice to the demand for a new land policy. A main factor is for publicly owned land to no longer be sold to the highest bidder. The purely economic criterion neglects social, Baukultur and ecological aspects. In contrast, sustainable handling of the existing building stock can be anchored in concept-oriented calls for proposals.

Although many municipalities still designate new build areas to a large extent, brownfield areas are also the topic of a large number of municipal development plans. In the last 20 years, large areas were available for urban development through conversion. Today the focus must be on smaller brownfield development and handling the existing building stock. Brownfield development requires a survey of the existing stock in order to assess the starting position. The BBSR has produced the apt publication for this: *Bauland- und Innenentwicklungspotenziale in deutschen Städten und Gemeinden* (Building land and brownfield development potential in German cities and municipalities).

In their Coalition Agreement, the governing parties agreed to examine the introduction of a brownfield development measure (IEM, Innenentwicklungsmaßnahme) as part of special urban planning legislation. This would enable municipalities to obligate owners to build on undeveloped or underused land plots by drawing up an IEM local development plan. If the parties responsible fail to meet this obligation quickly enough, the municipality can present them with an offer to buy the property and as a last result can even decide to dispossess them.

An approval proviso, which prohibits the sale of building land above the fair market value could also help to slow down the price trend. In addition, tax adjustments can use the rise in land values for the common good instead of leaving the profits wholly to the owners.

Uncoupling building projects and land value would also benefit the Baukultur of Conversion: The decision to demolish is often only made because it allows the land value to be exploited more. In an award under *Erbbaurecht* (heritable building right) ownership of the land and the building are separated. The municipal or church issuer of the heritable building right receives a ground rent for the land. Recipients of the heritable building right can build on the land and become the owner of the building. This constellation can give the municipality a right to a say and more control over the building and use. An obligation to renovate existing buildings can also be stipulated in this way.

In view of prolonged low interest rates, increased land values and simultaneously high ground rents of four to six percent, heritable building rights have recently become an inflated source of fees for municipalities and churches and a one-sided contractual dictate over the heritable building right holders. In the interests of the original social and Baukultur idea, a “new heritable building right” is needed, which allows individual and objective contractual arrangements on an equal footing. Policymakers in politics and administration must reposition themselves.

Exclusive brownfield development is rare

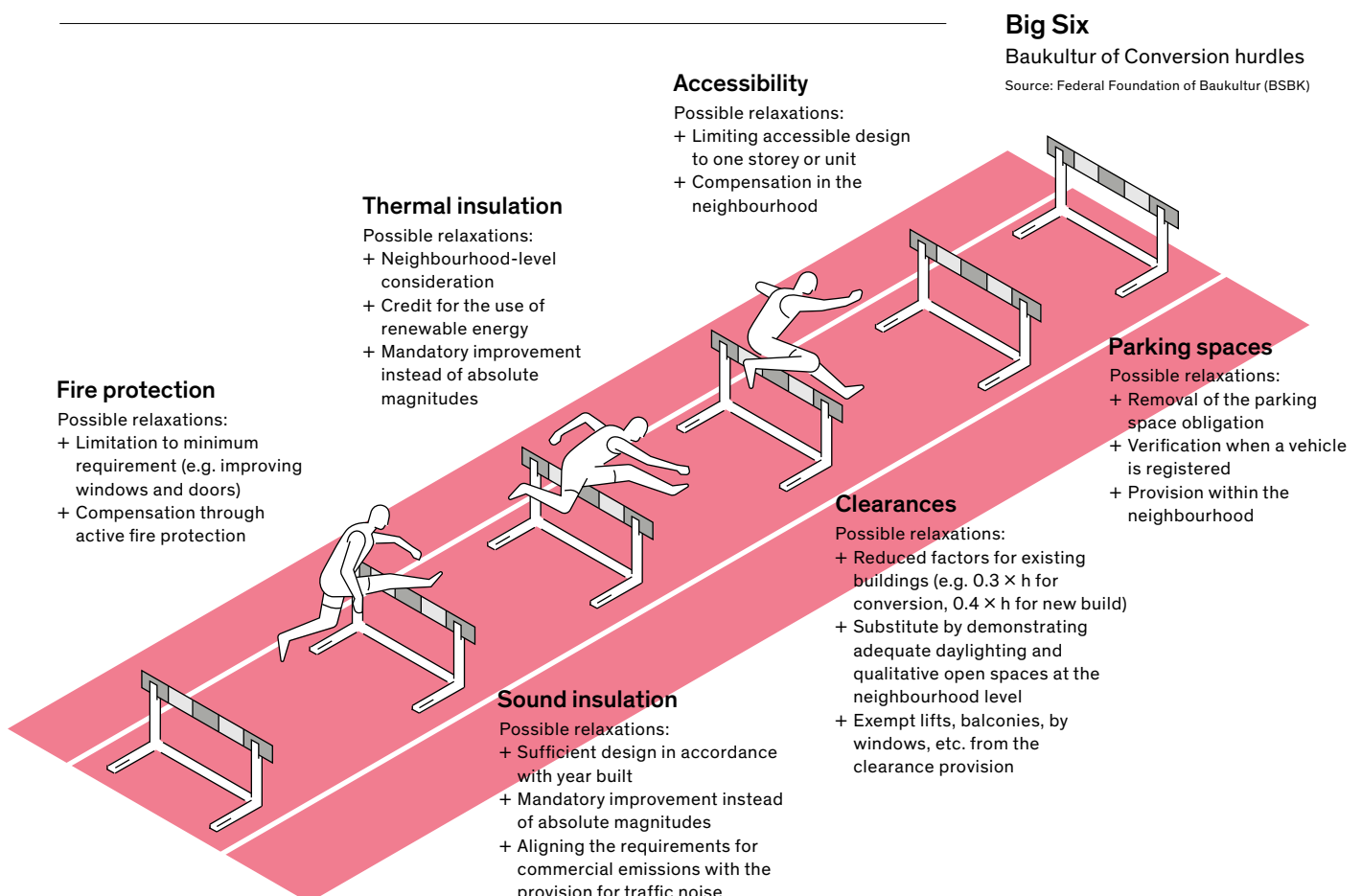
Almost two thirds (63%) of the municipalities surveyed state that they create local development plans not only for the unplanned greenfield area but also for the brownfield area. Only one in ten urban municipalities concentrate on the brownfield area. In the cities it is every third municipality. [M23](#)

Planning and Building Laws Building law is new build oriented. In view of the social consequences, renovation and building in the existing fabric should, however, at least be coequal with new build. A betterment would be preferable to facilitate measures in the existing building stock.

In a discussion on the topic with professionals, the Federal Foundation of Baukultur defined the “big six” barriers: Requirements regarding thermal insulation, sound insulation, fire protection, setback and separation distances, accessibility and the provision of parking spaces cause the greatest problems for building in the existing fabric.

In the case of thermal insulation, Art. 105 of the Gebäudeenergiegesetz (Building Energy Act) already allows listed buildings and particularly protected or preservation-worthy building fabric to deviate from the act if it would impair the appearance or would cause disproportionately high cost or effort. There should also be easements for general building in existing fabric, which apply as a rule and not only by exception.

For a long time, the Federal Chamber of German Architects (BAK) and the Federal Foundation of Baukultur have called for the Musterbauordnung (Model Building Code) to be changed in an Umbauordnung (Conversion Code) and in November 2021 they appealed to the Conference of Building Ministers. The matter is supported by private initiatives such as “Architects for Future”. In 2021, the society also submitted a proposal for a Musterumbauordnung (Model Conversion Code). The proposals begin where the effort for building measures in the

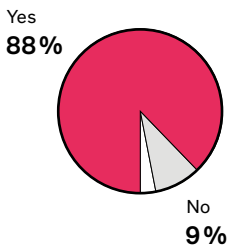


Retain buildings wherever possible!

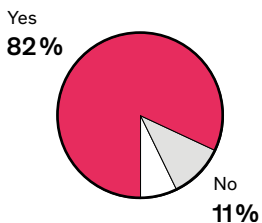
Opinions of the population on the demolition of buildings

Source: Population survey for the Baukultur Report 2022/23

Buildings should be assessed for their quality and conversion potential before being demolished!



Preference should be given to retaining a building rather than demolishing it!



existing building is so high that it makes renovation and continued use difficult or prevents them altogether.

In the case of fire protection, a list of defined compensations is named as an alternative to the current Zustimmung im Einzelfall (ZiE, project-related approvals). Accessibility could be achieved through a neighbourhood approach without leading to a larger space requirement in every building. The sound insulation requirements should be uncoupled from the high new build standard and be viewed as a mandatory improvement.

As far as parking spaces are concerned, the state building codes of Berlin and Hamburg point the way ahead. There, the obligation to provide car parking spaces for apartments has been abolished. In Berlin, only parking spaces for the disabled must be demonstrated for publicly accessible buildings.

Clearances can become a problem for an annex or additional storeys. In order to acquire more living space and upgrade the existing building without sealing land, proof of adequate ventilation and daylighting should suffice. The protection of biodiversity, like that of living and recreational quality outdoors, can be verified by demonstrating high-quality open spaces at the building or neighbourhood level – better than through clearances. As a first step, at the end of 2021, the Fachkommission Bauaufsicht (expert committee on building control of the Conference of Building Ministers) approved the draft of an amendment to the Model Building Code, which most notably contains adjustments to the clearances and fire protection, which benefit existing buildings.

Adapting a building to legal requirements that did not come into force until after it was built naturally creates particular difficulties. Wide-ranging grandfathering, as called for by the Bavarian Chamber of Architects, could be helpful – for example, in the form of a legal list of easements that allows reduced minimum standards when handling the existing building stock. If existing buildings were to be evaluated according to the technical requirements at the time of their erection, it would make the conversion considerably easier.

As the BAK proposed in its paper *Zukunft ist eine Frage der Planung* (Future is a question of planning), exemptions for the existing building stock, which extend beyond the individual building, can be anchored in local development plans. In this context, the land use zones of the Land Use Ordinance (BauNVO) should also be checked (see *Vibrant and Mixed City Centres* chapter). These zones define the type of use and the density of built use. Conversion, repurposing, more flexibility and higher density should be the general principles of future revisions.

Much must also change in new build, in order to smooth the way for subsequent conversions. Alongside technical proofs, the requirements for planning permission or a building permit could just as well include verification of the flexibility and adaptability of the planned building. Low ceilings often make conversion difficult. Stipulations in the local development plan on the density of built use should therefore counteract this by including information on the number and height of storeys; minimum heights in the building code should be adjusted.

In 2020, the federal government summarised the energy requirements for buildings in the Building Energy Act (GEG). The energy demand is no longer the only criterion, proofs can now be provided in two ways: In the conventional primary energy method, it must be demonstrated that the energy demand of the renovated building is no more than 85% above that of a comparable new building. In the

greenhouse gas method, on the other hand, it is demonstrated that the emissions are not higher than those of a new building. In this case, a deviation from the insulation standard can be approved. However, here too, the energy demand may only be 85 % above that of a new building. However, calculation by this method must be applied for separately and must be supplemented with a report on investment costs, energy consumption figures and experience with the method.

If entire neighbourhoods are assessed together, energy efficient new buildings could compensate for the deficits of older buildings. This is also now possible and benefits retention of the existing building stock. Nevertheless, the consideration of the emissions remains subordinate. The Baden-Württemberg Ministry of the Environment, Climate Protection and the Energy Sector commissioned a study on a recast of the GEG. Accordingly, in future the emission of greenhouse gases should be defined as an “actual target value” and the grey emissions should be taken into account.

The fact that in most cases, demolition in Germany does not require approval must be challenged, especially given all that we now know about embodied energy and its climate impact. The population – as the current survey shows – urges that before a building is demolished, its retention should be examined.

A demolition permit, which would have to first prove with analyses and cost calculations over the whole life cycle or by examinations of the load-bearing capacity that a building is deficit, would curb the demolition-new build dynamic. In all comparative calculations, the expenditure for demolition and disposal must be allocated to the replacement new building. That is the only way to achieve a true comparison of the alternatives. To prevent buildings from deliberately being run down until they are ripe for demolition, built heritage protection could again serve as a model: The built heritage protection laws of many countries contain an obligation to retain and maintain, which the country can enforce through preservation orders.

In the Brussels region, a demolition is now only allowed if the parties responsible have submitted an urban mining concept, which verifies the greatest possible reuse of material in the new building. In Germany, however, the reuse of building elements mostly fails due to unresolved issues of liability and a lack of approvals. The relevant regulations must therefore be revised and adjusted. A short-term remedy could be a list of all project-related approvals, which relate to construction materials and especially to secondary materials. Such a reference would provide transparency and planning certainty. Including documentation on dismantling and continued use in the planning application can also increase awareness of buildings and material beyond their first use.

Assessing the Existing Building Stock According to a structural data report of the BBSR, in 2020, 60 % of construction work in commercial buildings was carried out on the existing building stock. In housing the figure was 69 %. This corresponds to the results of the municipal survey: Half of all municipalities state that they would rather convert than build new buildings.

When redeveloping or restructuring our cities, as necessitated by demography and climate change, it is not sufficient to merely pay attention to the retention of heritage buildings. The structure of entire neighbourhoods and cityscapes must become the starting point for a new design. “Building stock particularly worth protecting” plays an important role in this. Alongside heritage buildings,

More than half would like information about demolitions in the neighbourhood

A majority of 57 % would like to be informed about the pending demolition of buildings in their city or neighbourhood. Most notably, people in large cities and younger people want to be informed. P10c

Handling building fabric particularly worth protecting

Source: Municipal survey for the Baukultur Report 2022/23

The term is not used in **52%** of the municipalities

Only **6%** of the municipalities have public and uniform evaluation criteria

Baukultur Sets an Example

Federal Foundation of Baukultur in Potsdam – Repurposing Instead of New Building



For a good ten years, the heart of the Federal Foundation of Baukultur has been beating in a building that was converted in a respectful and a future-oriented way. During this time, the Foundation has evolved with its tasks, however, it has not outgrown the building which effortlessly represents the timeless position of sustainable architecture. The building's surroundings in the Schiffbauergasse, formerly used by the military, has developed into a vibrant art and cultural neighbourhood. Every two years, when the Federal Foundation invites people to the Baukultur convention, its neighbourhood with the Schinkelhalle, Waschhaus and Waschhaus Arena, T-Werk and Schirrhof venues proves to be a location advantage. It not only offers plenty of space, but also the necessary infrastructure for the plenum, forums, presentations and reception. The proximity to theatres, museums and the Tiefe See lake provides a special atmosphere.

The headquarters of the Federal Foundation of Baukultur lies in the middle of the twelve-hectare conversion site. For Springer Architekten, the firm that won the selected compe-

tion together with Georg Heidenreich in 2008, it was important to detach the Red Villa from its role as vis-à-vis of the barracks. The entrance and decorated gable of the building, which had served as the regiment's uniform store, was oriented towards the middle building of the horseshoe-shaped military complex. The architects moved the entrance to the east side and there they opened up the red brick façade with a large showcase window. People arriving at the building are therefore invited to enter in a visually pleasing way. In front of the new entrance there was sufficient space for an accessible access ramp and a terrace garden, which the Foundation can use for small events and receptions. Weidinger Landscape architects designed the outdoor area. Despite all due consideration of the listed existing building, the conversion was intended to set an example, and despite its modest size, create a distinctive position for the Foundation headquarters in the neighbourhood. Springer Architekten replaced the old roof with a new storey with wall-high windows on all sides, which open up the view of the lake to the south and east.

Above the cornice, vertically rib-knitted brickwork continues the red brick architecture and in places lays a grid pattern over the glass surfaces, which scatters the light. The added storey and existing building thus act in union despite the distinguishable building period differences. The fact that the old brick masonry was repointed with reddish mortar also contributes to the sedate appearance. Skilled craftsmanship details are important.

The space allocation in the old building has hardly changed. A few interventions opened up the ground floor for guests and the public. The added storey enabled a two-storey area in the stairwell that serves as a kitchenette and communicative centre of the Foundation. Everyone who has worked here emphasises how important this open space is, which links all the work levels.

With this resource-saving, sensitive conversion of the Red Villa into the Foundation's headquarters, the designers have taken a clear stance in the discussion on sustainability and energy efficiency, which the new version of the EnEV 2007 (German Energy Saving Ordinance) had intensified still further. As the high-quality and typical local red brickwork excluded external insulation, the internal walls were insulated with calcium silicate boards. New windows in the old style have also improved the U-values. As the policy of the time required the use of more renewable energy, the Foundation headquarters, which was also intended to serve as a model, was equipped with a photovoltaic installation. It is positioned – where it cannot be seen from the road – behind the edge structure of the flat roof. The architecture, like the neighbourhood, remains unaffected by it.

Since moving into the building in the Schiffbauergasse, the Federal Foundation of Baukultur has taken a public stance for high-quality, unpretentious and resource-efficient repurposing in historically evolved contexts.

Facts

Design and construction: 2008–2011
 Size: 688 m²
 Developer: The City of Potsdam, represented by Pro Potsdam
 Designers: Springer Architekten with Georg Heidenreich, Berlin; Weidinger Landschaftsarchitekten, Berlin;

Ingenieurbüro Rüdiger Jockwer, Berlin;
 Planungsbüro Dernbach, Berlin
 Cost: €1.04 million

More information in the project description in the appendix on p. 122



BAUKULTUR AT A GLANCE

- Foundation HQ as an expression of actively practised Baukultur (of Conversion)
- Light workspaces in the former warehouse building
- Respectful and yet confident handling of the existing building
- Central recreational space over two storeys



Advice for conversion projects

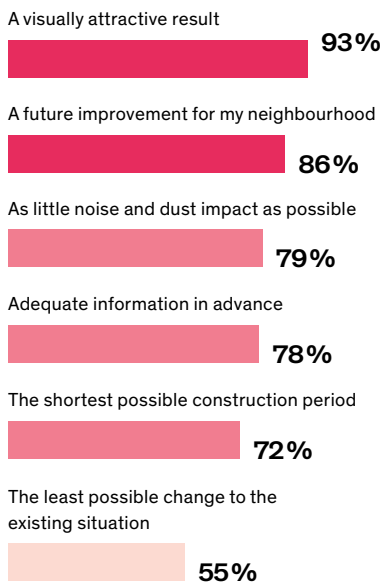
60 % of the municipalities surveyed state that they offer building advice or advise those who want to build. However, only 4 % of the administrations have a building protection department. 30 % of the cities surveyed do not also involve the department responsible for the protection of historical monuments in development tasks for unlisted existing buildings.

[M24](#) + [M25](#)

For the people, a good result counts in building projects!

Source: Population survey for the Baukultur Report 2022/23

What would be important to you regarding a construction project in your vicinity?



Article 105 of the GEG also grants this building stock/building fabric a special role, however, without defining the term.

In 2014, the Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (BMU, Federal Ministry for the Environment, Nature Conservation and Reactor Safety) at that time published guidelines titled *Die besonders erhaltenswerte Bausubstanz in der integrierten Stadtentwicklung. Erkennen – Erfassen – Entwicklung steuern* (Building stock particularly worth protecting in the integrated urban development. Control its identification, recording and development). Precisely what falls under the term is decided by the municipalities, which handle it in very different ways. According to the municipal survey, only 6 % of the municipalities have uniform criteria for what is deemed to be “Particularly worth protecting”. 52 % do not use the term at all.

By designating redevelopment areas and built heritage areas and drawing up preservation statutes, several cities and municipalities already define areas particularly worth retaining. Defining redevelopment areas causes additional administrative workload, but it can also win over owners by offering higher tax write-offs (accelerated depreciation) for renovation and conversion. Since 2012, in its “KfW-Effizienzhaus Denkmal” (KfW efficiency house – historic building) programme, the KfW bank has promoted the energy-efficient renovation of building fabric particularly worth protecting. In this case, the municipality must confirm that in its view the fabric is particularly worth protecting.

Against the background of the necessary energy upgrade, the recording and definition of existing building stock particularly worth retaining becomes a higher priority. There is a high risk of Baukultur values being lost during the course of building renovation measures. Cities such as Friedrichshafen and Hamburg are currently recording their building stocks particularly worth protecting – based on current knowledge. In Hamburg it accounts for almost 40 % of the city area – and based on this, the city is developing concepts for retention, energy-efficient renovation and further development.

Even buildings that are neither listed nor count as building fabric particularly worth protecting should still be converted with high spatial quality and design standards. The authorities responsible for the protection of historical buildings and monuments provide advice for a heritage building. For all other cases, the building control offices are responsible. A special advisory body for conversion and potential assessment could encourage many to retain building fabric.

That which is already built characterises the cityscape and is decisive for residents’ identification with it. There are now more than 130 architectural advisory boards in Germany, which could ensure broad public acceptance. In many cases they also deal with conversion tasks.

New Structures for Design and Construction

Baukultur Education Contrary to the general perception, how their living space is designed is very important to people. If building work is being carried out near them, they pay more attention to an attractive result than to minor nuisance due to noise and dust. This was shown by the population survey for the Baukultur Report.

Yet, according to the “Davos Baukultur Quality System”, only those who are sensitised to the built environment can help fashion it and therefore also participate in social coexistence. Every person should therefore have access to Baukultur education. It is not sufficient to integrate Baukultur topics in art education – especially as arts subjects are short-changed in the curricula. Baukultur education could instead have an interdisciplinary general educational and formative effect. Approaches and model projects already exist, as the *Baukultur braucht Bildung!* (Baukultur Needs Education) manual of the Federal Foundation of Baukultur shows.

A Baukultur of Conversion also sets different challenges for Baukultur education. Although the redesign of living space is a popular topic in magazines, TV programmes and social media, according to the population survey, only 12 % of the people think of interesting architecture when it comes to conversions. To change this, Baukultur education must present successful transformations and convey the advantages of an often unloved everyday architecture.

A growing number of initiatives and networks deal with the specific communication on site and in the social media. Take a look inside and discuss it is one of the basic techniques of these offers, which are not only directed at school and university students. An early eye-opener, for example, was the “Liebe Deine Stadt” (Love your city) art project, which Merlin Bauer started in Cologne in 2007. A “day of architecture” or “day of the open historical building” are also commendable initiatives, however, it takes more than low threshold offers in everyday life to strengthen people’s aesthetic judgement. The Baukultur Convention, as a central forum of all building professionals in Germany, therefore passed the *Potsdam resolution on Baukultur education* in May 2022 and called for Baukultur education in Germany to be strengthened and placed on a stable foundation in all educational facilities.

There is also a need to catch up in vocational training and higher education: When asked by the Federal Foundation of Baukultur, 91 % of the skilled trade firms would like retention and conversion as well as good design to be included in the intercompany training.

In universities, for a long time the focus was on designing spectacular buildings and urban neighbourhoods. In times of climate change, the students are now more interested in dealing with the existing building stock, which was often deemed a second-class building task in the past. Getting to grips with this gives higher education teaching the opportunity to introduce more practical relevance. Redesign projects open up the opportunity to examine real, existing buildings and to discuss them with their users. Where existing building analysis is included in curricula, knowledge about the existing building stock and its importance should increase.

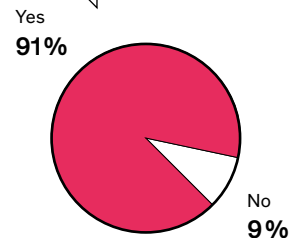
The existing building stock reveals solutions that have stood the test of time. This is just as important for the rediscovery of simple building methods as it is for attempts to separate and reuse construction materials, thereby making it all the more crucial for building history principles to be taught in degree courses. Yet in architecture courses, building history is considered by many to be a secondary subject and historical construction methods are no longer taught at all in some civil engineering courses.

Building in the existing fabric has instead become the subject of special academic courses especially at universities of applied sciences (Fachhochschulen,

Baukultur of conversion as part of skilled trade training

Source: Survey of the trades for the Baukultur Report 2022/23

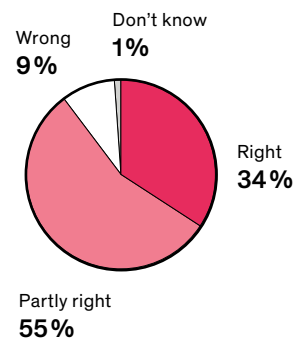
Should the topics of retention and conversion of buildings and good design be part of industry-wide training?



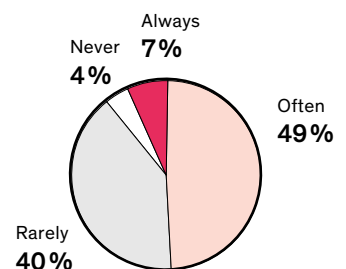
New build as the ultima ratio (last resort)?

Source: Survey of planning and design professionals for the Baukultur Report 2022/23

The planning and design professions find the call to only allow new build projects as the ultima ratio is...



Implementation of the standard in professional practice



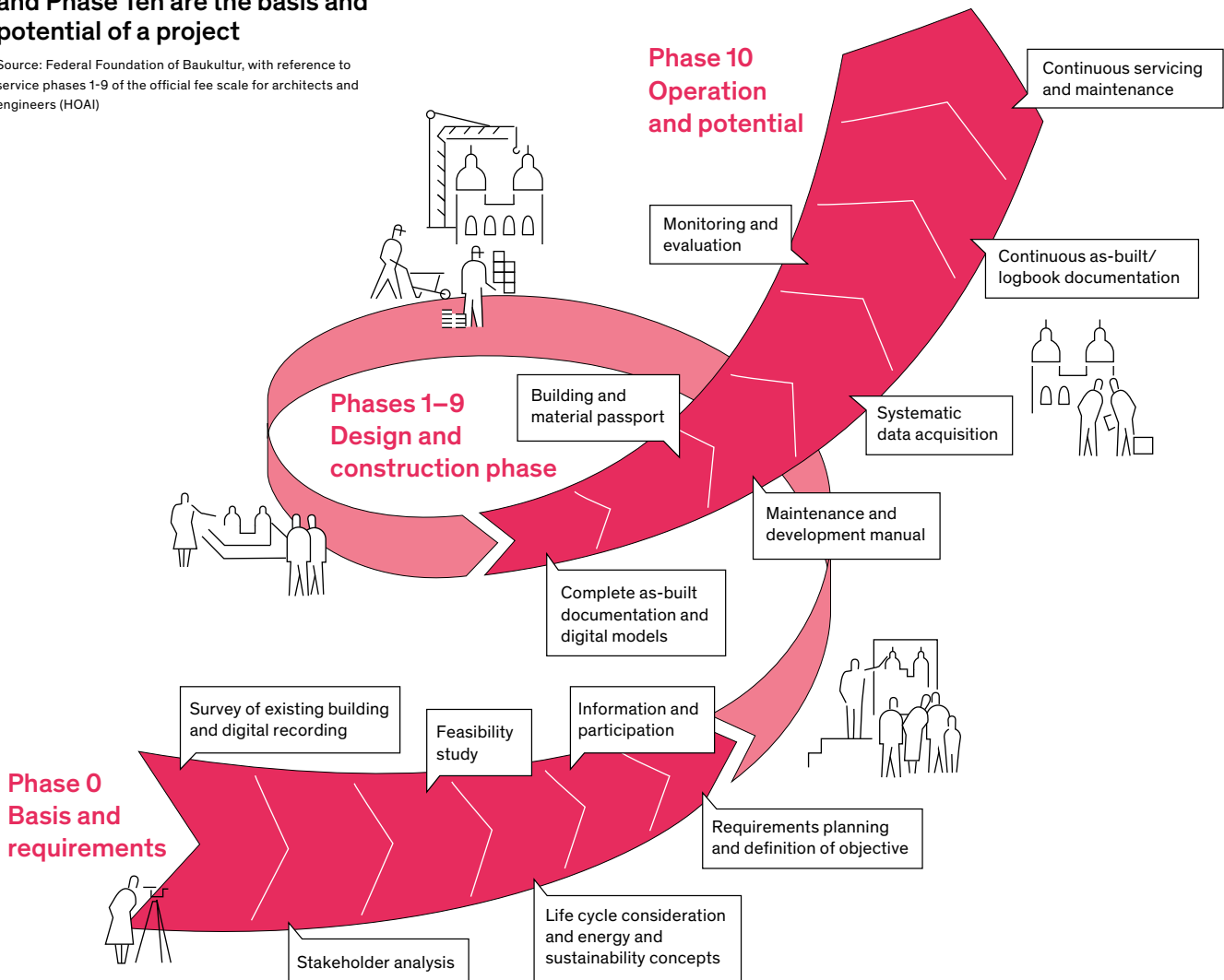
FH). The Department of Civil Engineering of Münster FH, together with the Akademie Bauhandwerk (Building trade academy) of the local Handwerkskammer (Chamber of Trades) offers a bachelor's degree course in Bauen im Bestand ("Construction in existing contexts"). Anyone who has passed their "Abitur" (university entry qualification) or has completed vocational training in a building trade can apply. At Potsdam FH, students can do a master's degree (MEng) in "Bauerhaltung und Bauen im Bestand" (Building conservation and construction work on existing buildings). The syllabus is based on a cooperation between the civil engineering, architecture and urban planning, conservation and restoration degree courses.

At several universities, the Baukultur of Conversion has developed into a main interdisciplinary research area: Alongside the constructional and historical aspects of conversion, chairs of the Bergische Universität Wuppertal also examine circular building.

Equally, everyone who already works in their profession must be upskilled to handle the existing building stock. First and foremost, construction and legal knowledge must be taught. Appreciation for the existing building stock has long since existed. In a Federal Foundation of Baukultur survey of planning and design

Project stages Phase Zero and Phase Ten are the basis and potential of a project

Source: Federal Foundation of Baukultur, with reference to service phases 1-9 of the official fee scale for architects and engineers (HOAI)



professions, 89 % of the respondents answered that they consider it to be right or somewhat right for new buildings to be approved only as a last resort. Moreover, 77 % stated that they had already proposed the retention of a building to the owner/developer, of their own volition and contrary to their brief.

Anyone who wants to convert is initially faced with supposed obstacles. If the costs are the same, preference is therefore often given to new build rather than renovation. Yet many of these obstacles are negligible or can be resolved. Baukultur education must therefore draw attention to values beyond fitness for purpose and rate of return, especially as an awareness for architectural qualities helps us to overlook minor deficits – and this also includes a different contemporary taste.

Against the background of the continuing shortage of skilled workers, a Baukultur of Conversion can make building trades more attractive. Since 1999, the “Jugendbauhütte” programme of the German Foundation for Monument Protection, in which 16–26-year-olds do voluntary work on built heritage conservation projects for a year, has also helped to win over new recruits for the industry. 80 % of the 2021/2022 volunteers stated that they aspired to start vocational training or a degree course in a trade or built heritage conservation.


Phase Zero and Phase Ten An extension of the nine service phases on which the HOAI, the German fee scale for planning and design services, is based was a recurring topic in previous Baukultur reports.

Successful planning preparation in Phase Zero and well-thought-out operation and easy repair in Phase Ten are even more decisive for the Baukultur of Conversion: In Phase Zero, the basics for the planning and design, construction, operation, conversion and dismantling of a building are developed based on an investigation and survey of the existing building, a stakeholder analysis and feasibility studies, life cycle considerations and energy and sustainability concepts. Information and participation processes also take place so that at the end, the requirements planning and definition of the objective are agreed and therefore the course is set for a successful project.

The success of Phase Ten is also decisively dependent on this. Servicing and maintenance should be considered from the outset and defined in maintenance and development manuals. Complete as-built documentation is necessary for subsequent conversions and is also continuously updated in building and material passports. Systematic data acquisition is therefore needed.

DIN 18205 (Bedarfsplanung im Bauwesen (Brief for building design)), first published in 1996, is a requirements planning instrument for establishing the basis of decision making before a project enters the classic planning phase. Even after 25 years, however, this instrument is hardly used in practice. The HOAI (German fee scale for architects and engineers) begins with the basic evaluation of a specific construction project (service phase 1). The requirements planning is thus a particular service in advance – and not a self-evident part of the construction project. The decision between retention or demolition and new build, however, is made much earlier. If the existing building is recorded and its potential analysed in Phase Zero, it can lead to a rethink. At the same time, the required room allocation can be compared with what the existing building offers. In order to give economic, societal, social and climate arguments equal consideration in Phase Zero and to align the project with sustainability objectives, it is

Planners and designers in favour of retention instead of demolition

77 % of the planners and designers surveyed state that they have already recommended retention and conversion instead of demolition on their own initiative and contrary to their task. 

Baukultur Dares to Experiment to Use Vacant Buildings

Eiermannbau Apolda – The Art of Designing Sustainably Into the Blue



The small town of Apolda in Thuringia has waited a long time for someone to invest. Production in the textile and fire extinguisher factory ended in 1994. Since 2016, the IBA Thuringia has developed the industrial heritage building into the Open Factory by unconventional means. This has made the “Eiermannbau” building a name that is recognised nationwide and has attracted the interest of universities, educational establishments and creative individuals.

The multistorey factory was erected starting in 1906 as a reinforced concrete framework building near the railway station. In 1936, the Total company took over the site. The young architect Egon Eiermann was given the brief to extend the existing building. He sensitively linked to the existing structures by interpreting them in a modern way: The supporting structure became more slender, the windows larger. On the third floor, Eiermann created a column-free, light-filled dining hall and on the roof – together with the landscape architect Herta Hammerbacher – a greened sun deck for the workforce’s lunch breaks. The Eiermannbau is therefore not only an out-

standing industrial heritage building but also a historical example of the Baukultur of Conversion. Despite the unusual qualities of the building, after the company had been wound up, hardly anyone was interested in it – until the International Building Exhibition (IBA) drew attention to the site and, together with the Wüstenrot Foundation, the first “IBA Campus” with 26 students was held in the summer of 2016. The participants camped in tents in the factory, installed a cinema, started a ping-pong club and developed other ideas for reprogramming the building into the Open Factory. With the “Anhandgabe” (exclusive option period) form of contract, the Thuringia Landesentwicklungsgesellschaft (regional development company) has given the innovative, interdisciplinary, participative and learning design culture of the IBA the necessary public backing. The funding in the federal “Nationale Projekte des Städtebaus” (National Urban Planning Projects) programme shows what high expectations are linked to the pilot project, which deals with the potential of empty buildings for the development of urban municipalities and cities.

“Examination of the existing building is changing the job of the architect”, explained Katja Fischer, project manager of the Open Factory and initiator of the LeerGut (“empties”) focus at the IBA. She sees her work as being curatorial. What has been done up until now cannot be equated to Phase Zero, because there was no demand and also only a vague task. Much had to be tried out and many people spoken to, for example, about what the listed factory can even achieve. The discussions repeatedly returned to the basic question: How little is enough?

The first, still minimal-invasive interventions involved erecting greenhouses on plywood bases. While the whole space is heated to only 12 to 15 degrees by ceiling heating panels, the workplaces in the greenhouses can be heated via exposed utility routes if necessary. Due to the installed glass greenhouses the factory floor retains its expansiveness. Its “exterior space” with kitchenette and seating areas can be used as a communication zone all year round. The low-tech air-conditioning concept, developed by the Hausladen consulting engineers, uses cross-ventilation and night cooling.

The other floors of the factory will also be fitted out neutrally, for no specific use, and minimally in technical and spatial terms. “Climate curtains” will be attached in front of the large factory windows. The finishing elements, made of wooden uprights and straw panels, can be easily dismantled. Future tenants can continue to develop their own areas as DIY. The roof area with its railing and shed roof will be repaired in line with the needs of built heritage protection and in the future will be open to all to use. Favourable basic conditions are thus created for diverse uses, which re-anchor the Eiermannbau building in the region and in the life of the town. Vacant spaces should be excluded for a foreseeable time.

Facts

Design and construction: 2018–2023
 Size: 6,300 m²
 Developer: Internationale Bauausstellung (IBA) Thuringia
 Designers: IBA Thüringen / Katja Fischer and Tobias Haag, Apolda; Ingenieurbüro Hausladen / Prof. Dr. Elisabeth Endres, Kirchheim; IPH – Ingenieurbüro Peter Hilbig, Wickerstedt; b.i.g. bechthold ingenieursgesellschaft, Weimar; GBI

Gesellschaft Beratender Ingenieure, Erfurt; Ingenieurbüro Matthias Münz, Weimar; Sebastian Stieß, freelance architect, Leipzig; Station C23 Architekten und Landschaftsarchitekten, Leipzig
 Cost: €3.64 million

More information in the project description in the appendix on p. 122



BAUKULTUR AT A GLANCE

- Minimally invasive redesign of the built heritage
- Low-tech instead of high-tech building services
- The use concept follows the potential of the existing building
- Development of the concept as part of an “IBA campus” by students
- Successive appropriation and redesign by users



important to include the specialist knowledge of many disciplines. The German Sustainable Building Council (DGNB) and the Federal Chamber of German Architects have developed a “Phase Sustainability”. The objective of the initiative is to establish sustainability as a planning and design standard. Based on 18 courses of action, specific sufficiency, climate action, environment, circular economy, positive spaces and Baukultur goals are to be set and prioritised.

In projects on an urban scale, Phase Zero frequently involves technical investigations, participation processes and the question as to whether and to what extent a location is at all suitable for construction projects. Involving the users early and giving them opportunities to participate increases acceptance – during and after the construction period. Design competitions also help to determine the potential of a project.

The HOAI service phases end with the completed implementation of a project. However, the condition of the building suffers due to intensive use, vacancy, sale, lack of investments or neglect. A Phase Ten that deals with continuous maintenance, repurposing and adaptation (adaptive reuse), helps to keep the existing building in good shape and avoid early demolition. This is already indicated in service phase 9 of the HOAI. In addition to the as-built documentation of a building and servicing and care instructions, it also mentions a maintenance concept. In its documentation guidelines, the Bundesamt für Bauwesen und Raumordnung (BBR, Federal Office for Building and Regional Planning) requires a complete package of documents at the end of a construction project. It includes product documents for all installed products, maintenance and care information with instructions for operation, servicing and maintenance, which even define cleaning intervals, as well as instructions for any repair and replacement works.

Such thorough documentation not only helps to secure the existing building. A Phase Ten also provides a survey of the existing building for a new Phase Zero of subsequent conversions. If changes to the building were also documented over the years and building and structural damage reports were kept, the cost and time uncertainty of a conversion decrease significantly. Reusing dismantled building elements requires sufficient information. If the way the building develops after it is put into service is recorded, documented and evaluated, this also has a learning effect. Designers can check their design decisions and interpret the satisfaction of the users based on what was retrofitted and which technical equipment was used.

Projects such as “BIMKIT” at the Ruhr-Universität Bochum use artificial intelligence (AI) to develop the as-built modelling of buildings or infrastructures into the digital twin. These are digital representations of real buildings in the context of their surroundings. BIM – short for *building information modelling* – tends to describe static building models.

Digital twins go a step further: They are dynamic. They can be used to test operating options, for example. Constant updating of the model during the building’s use period enables faults and damage cases to be analysed and sound decisions to be made on the further action to be taken. Changes in use can also be simulated or the effect of individual measures on comfort and the environment can be assessed. However, AI applications are still just a tool. They do not replace the decision-making power or value judgement of the designers.

In a similar way, BIM and digital solutions are becoming increasingly important in building management. The municipal survey shows: Every second city and

almost every third rural municipality plans to completely digitalise their building stock.

As-built is the term used by professionals to describe building data models acquired not from the design but from the surveying and data acquisition of existing buildings. Such as-built models can also record a conventionally designed building at the time of completion – including all its technical installations. If the model is extended to include information on servicing, it becomes a new tool for maintenance. Buildings are no longer seen as a completed process but are maintained and updated and adapted to new needs. Ideally, Phase Ten will therefore become the starting point for continuous repurposing.

Processes for a New Baukultur of Conversion Digitalisation in construction is increasing. This holds opportunities to question established procedures – including for the building authorities. The German Onlinezugangsgesetz (OZG, Online Access Act) obligates the federal government, federal states and municipalities to offer their administrative procedures in digital form by the end of 2022. This also includes the application for planning permission or a building permit. Since the beginning of 2021, simplified building permits can be submitted in digital form in the Landkreis Nordwestmecklenburg district. The then Federal Ministry of the Interior, Building and Community (BMI) supported the government of Mecklenburg-Western Pomerania with the development. Other federal states should use this groundwork and soon follow. The states of Saxony-Anhalt and Rhineland-Palatinate are already doing so.

With the di.BASAI platform, the chambers of architects and engineers have set up a digital information centre, which enables users to check the qualifications and authorisation of designers online.

In architecture and consultant engineering companies, digitalisation leads to new ways of working. In a BIM process, many design decisions are made significantly earlier. This also helps to take action in an existing building with greater time and cost certainty as well. At the beginning of the project, a sensible scope of digitally aided design must be defined. Through digital surveying – including with laser scans – even the most geometrically complex buildings can be translated into 3-D models. In the case of larger conversions – for example, dismantling down to the building shell – potential collisions can be identified quickly and visualised in the BIM model. The condition, contaminant load or structure of existing buildings can also be analysed by continuously developed digital techniques.

Precise digital models also allow a high degree of off-site production for renovations. This allows even the façades of buildings that are occupied to be renovated. Most buildings of the 1960s have regular structures. This enables modular and serial working for a conversion and thus saves time and costs. One example is the Dutch *Energiesprong* principle, which was applied in Germany for the first time in 2019, in the Lower Saxony town of Hameln.

In the EU “BIM Speed” project, researchers headed by the Technische Universität Berlin, are attempting to develop a BIM model as a catalyst for efficient and fast renovations. It is focused on multi dwelling buildings erected between 1945 and 1970. The BIM Speed process enables a time saving of 30 % and reduces the energy demand by 60 %. The system is currently being tested in 13 projects throughout Europe.

Digitalisation of the municipal building stock

39 % of the municipalities plan to digitalise all buildings in the municipal stock. 61 % plan to do so for selected buildings only or not at all. [M29](#)

The HOAI also needs supplementing with regard to digital design methods and improved mapping of conversion works. The fee scale was developed for new build. Investigations on existing buildings or developing digital as-built models are therefore not part of the basic services. The latter only include the assessment of existing documents and the design based on them. Even so, the panel of chambers and professional associations for the fee scale have broken down how services for BIM designs are to be added to the HOAI. Continuing to document the condition of a BIM-aided project after its completion is accordingly also a service that has to be commissioned separately.

The intended reuse shifts attention onto the ability to dismantle new buildings and homogeneous separation of the materials used – especially as this could be linked to financial incentives in the future. Material registers and material passports, marketplaces for dismantled materials as well as efficiency in dismantling, transport and storage are new business models, which are already being created (see *Reusability* chapter).

Focussing existing regulations on the existing building stock is not the only task. An equally important aim is to provide more leegroom for experiments! In 2019, there were 3,750 standards relevant to buildings in Germany. They are developed by the German standards organisation, the Deutsche Institut für Normung (DIN), under an agreement with the Federal Republic of Germany dated 5 June 1975. However, the DIN construction standards committee (NABau) decides for itself on its composition, which according to DIN 820 should be balanced. At present, 63 % of the members are from industry. Science and research (15 %) and the public sector (12 %) are less well represented and the planning and design professions are not represented at all structurally. Standards are not legally binding but nonetheless they are frequently the basis of legal decisions. Deviations from established standards are therefore rare and their influence on building is correspondingly large. The composition of the committees should be reviewed and rearranged in the interests of cost, design and climate issues and less focus on industry.

Reducing legal requirements, which is in part happening for the digital industry, could also lead to innovative leaps, which ring in the transformation in construction. To this end, an initiative within the Bavarian Chamber of Architects proposes the introduction of an experimental building class E. Highly simplified regulations should give designers the possibility, together with owners or developers and in collaboration with regional skilled trades businesses, to develop appropriate and sustainable solutions separate from industrial standards. Here too, staffing building administrations and authorities with qualified professionals is also deemed to be crucial.

For a Baukultur of Conversion, all participants must rethink on all levels. Only with this approach can conversion today and in future link together social, climate policy, economic and aesthetic needs in the interests of Baukultur.

The Recommendations for Action of the Baukultur Report 2022/23

Make conversion the new model!

Diversely usable, multi-purpose locations, a reliable infrastructure and attractive, climate compatible living spaces must be the paramount objectives of future designs. Existing qualities in our cities, towns and landscapes must be identified and made usable as the starting point and inspiration for further development.

Redesign city centres for diversity of use and flexibility!

Cities and municipalities need a functional mix of retail, catering, leisure offers and culture as well as housing, education, commercial, production and social offers in their centre that is appropriate to their identity.

- The requirements of the TA Lärm (Technical instructions on noise control) of the Federal Immission Control Act and the use class types of the Land Use Ordinance should be revised in favour of a social and functional mix.
- It is necessary to create public places that are free from any pressure to buy and which are accessible to all. To achieve this, the logical thing to do is to link mobility, education and culture and to activate buildings other than for their original function (such as railway stations, churches, department stores and shopping malls).
- Inner cities and town centres should be developed and managed actively by means of long-term strategies and on the basis of mixed-use models.

Implement climate adaptation with a Baukultur of Conversion!

Adaptation measures necessitated by climate change must be linked to Baukultur concerns, in order to generate real added value for society that extends beyond mere necessity.

- The renaturation of landscapes must take into consideration design aspects as well as their use for agriculture and energy generation.
- To safeguard the quality of living in the cities, strategies for developing green and water areas and for increasing biodiversity must be embedded in the planning of public spaces.
- Baukultur should also be viewed more as an action level, in order to anchor concerns regarding climate adaptation and species protection in urban redevelopment projects.

Develop resilient infrastructures!

The mobility transition and climate protection require extensive adaptation of an infrastructure that in many places is already in a desolate condition due to a lack of care and maintenance. Baukultur must become the yardstick by which to solve the tasks that arise in a truly sustainable way.

- Cities and municipalities should develop flexible mobility concepts, which consider all road users equally but also make pedestrian traffic, as the most vulnerable group, the measure for spatial planning.
- The federal government must act to counter the renovation backlog, especially in railway and bridge infrastructure, and to this end, make Baukultur needs usable. Financial viability should focus above all on measures for existing buildings and structures.
- To achieve the climate protection goals, municipal heat planning with the focus on a neighbourhood approach should become obligatory nationwide.

Ring in a paradigm shift to a Baukultur of Conversion!

The focus of politics, administrations, the construction industry and the public must shift from new build to conversion if only for economic and ecological reasons. In this paradigm shift, there are opportunities for climate and resource protection, for a new understanding of design and for structures which will also still be valuable for future generations.

Realise that existing building stock is the key to climate protection!

It is not operating energy that is decisive for climate protection but the emissions generated during production, operation and dismantling. Existing building stock should therefore also always be given priority over new build because this conserves valuable resources.

- Emissions efficiency instead of energy efficiency, i.e. a life cycle assessment approach must become the standard in all obligatory and incentive systems.
- Raw materials, energy and emissions already captured in the existing building stock should be retained wherever possible. Demolition should become the exception and require approval.
- To curb land consumption, new settlement areas should only be designated in the final analysis. The priority of brownfield development should be implemented with greater consistency.

Use golden energy!

The existing building stock is not only valuable due to the grey energy stored in it, but also for intangible, cultural reasons. Knowing and communicating its value is a task for society as a whole. The participants in planning, design and construction must harness this golden energy and the potential of developing a new design language for dealing with the existing building stock.

- Baukultur education in schools, training and public life must aim at increasing social appreciation for the existing building stock, including for unlisted buildings.
- The Baukultur of Conversion must become more strongly anchored in framework training curricula and in higher education teaching.
- Responsible developers and owners of buildings act according to the premises of sufficiency. The possibilities of the existing building should point the way ahead, not opposing ideas of use.

Make convertibility the bedrock!

Structures should be designed so that subsequent changes in use and conversions can be implemented as easily as possible. Long-term acceptance is only established through quality. Flexibility and a convertible construction method, which nonetheless focuses on permanence in design and material selection, must become basic premises of design.

- In the interests of flexibility and repurposing options at a later date, the minimum room heights should be increased in the building code and alternative use options demonstrated in the application for planning permission or a building permit.
- Climate-compatible, regional and separable building methods designed for dismantling and user-friendly technical installations must become the standard in building.
- The use of high-quality materials and good design have proven their worth for sustainability due to their longevity. This should remain or become the basis of every private, municipal and property industry project development.

Gear structures to the new Baukultur of Conversion!

After decades of focussing on new build, it is now necessary to dismantle existing structures and standards and to realign them in the interests of a Baukultur of Conversion. There is an extensive need for adaptation in the legal and financial frameworks as well as in practised processes in administration and the construction industry.

Adapt framework conditions!

Both incentive systems and regulations can help conversion measures to become more important compared to new build. The principles of standardisation and approval procedures need close scrutiny.

- In model and state building codes, the requirements for fire protection, thermal insulation, sound insulation, clearances, accessibility and car parking spaces must be focused more on building in the existing fabric.
- The funding arrangements of the federal government and federal states must be primarily designed to achieve high-quality retention of the existing building stock.
- The duty to ensure a balanced composition of the DIN committees, stipulated by the “Staatsvertrag” agreement with the state, must be ensured. The development of standards should be subject to a cost, design and climate proviso and be carried out by appropriately qualified experts.

Recognise the responsibility of the public authorities!

Ecological, social and Baukultur responsibility should be exercised in the municipalities on an equal footing with financial responsibility. The public authorities should show the way by example and consistently promote, support and enable conversion projects in their advisory capacity. Contract award criteria must be adapted in the interests of sustainability and retention of the existing building stock.

- All larger public agencies are advised to set up a “specialist Baukultur department”.
- Representation of the interests of the existing building stock should be installed in the building authorities, similar to monument protection, together with a revival of design advice and building protection facilities.
- Awards and competitions should specifically address conversion projects and be announced to that end.

Focus on Phase Zero and Phase Ten!

The requirements planning and preliminary examinations of Phase Zero and the measures of Phase Ten that facilitate maintenance and operation are essential for a Baukultur of Conversion. Projects must be well placed to consider the specific features of the existing building stock, to bear in mind subsequent care, maintenance and conversions and avoid future demolition.

- Surveys or analyses of existing buildings should be undertaken regularly during the lead time and should be given greater funding.
- A database for maintenance and operation must be created and continuously updated. The creation of material passports should be promoted.
- Maintenance and development concepts for more complex structures must become the norm.

Appendix

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Holstenfleet Kiel (p. 42)

Location: Holstenfleet, 24103 Kiel

Objectives and measures: Revival of the city centre, develop place identity and awareness, climate adaptation and rearrangement of traffic by redesigning a busy street in line with the model of a historical canal

Uses: City centre square and traffic areas

Planning, design and construction: 2012–2020

Size: 17,000 m²

Cost: €18.5 million

Financing, funding: State and federal urban development programmes

Process:

- 2008: City centre prospects workshop
- 2009: Included as an ideas measure within the “Rahmenplan Innenstadt Kiel” (Outline Plan for Kiel’s City Centre)
- 2012: Competition
- 2013: Start of planning
- 2014 Public participation
- 2015 Council decision on realisation
- 2017: Start of construction
- 2020: Completion

Developer: State Capital Kiel, Public Works Department

Landscape Architecture: bgmr Landschaftsarchitekten GmbH, Berlin

Structural design: ifb – frohloff staffa kühl ecker Beratende Ingenieure PartG mbB, Berlin

General contractor/construction management: Merkel Ingenieur Consult, Kiel, and Siller Landschaftsarchitekten BDLA, Kiel

Structural and water engineering: Ingenieurbüro Obermeyer, Potsdam

Traffic planning: Masuch + Olbrisch Ingenieurgesellschaft für das Bauwesen mbH, Oststeinbek

Bridge design: Sauerzapfe Architekten GmbH, Berlin

Awards: Deutscher Ingenieurpreis Straße und Verkehr 2021; Deutscher Landschaftsarchitektur-Preis 2021

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Gundelsheim Municipal Library (p. 46)

Location: Bachstraße 12, 96163 Gundelsheim (Oberfranken)

Objectives and measures: Revival and urban planning restoration of the town centre by converting an existing building that, as the municipal library, was transformed into a community meeting place and place of learning for all generations

Uses: Library for children, young people and adults, work gallery, office, washrooms, reading café, multilingual reading area, multifunctional “barn” room, alternative area for the Wald Kindergarten, outdoor reading area

Planning, design and construction: 2017–2020

Size: 300 m²

Cost: €2.49 million

Financing, funding: Federal Ministry of the Interior, for Building and Community; Bavarian State Ministry for Housing, Construction and Transport; Government of Oberfranken (Upper Franconia) (urban planning funding programme and “Social Integration in the Neighbourhood” investment pact); Oberfrankenstiftung; Sankt Michaelsbund (financial backing and advice on the compilation and presentation of the media)

Process:

- 2011: Development of the integrated urban development concept
- 2016: Project competition
- 2017: Start of design, contract award and start of construction
- 2020: Completion

Developer: Municipality of Gundelsheim (Oberfranken)

Architecture, External Works and Site Supervision:

Schlicht Lamprecht Architekten BDA, Schweinfurt

Structural design: Tragraum Partnerschaft

Beratender Ingenieure mbB, Bamberg

Building services: Ecoplan Projekt GmbH, Bamberg

Electrical design: Planungsbüro Pabst, Bamberg

Building physics: Basic GmbH, Gundelsheim

Awards: BDA Preis Bayern 2022; Preis Bauen im Bestand 2021; Auszeichnung Guter Bauten in Franken 2021 (Honorary mention)

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MarinaMarina in Berlin (p. 52)

Location: Köpenicker Chaussee 3A, 10317 Berlin-Lichtenberg

Objectives and measures: Revitalisation, renovation and further development of two GDR administration buildings on a waterside property on the River Spree in the immediate vicinity of Klingenberg combined heat and power station

Uses: Artist studios and offices

Planning, design and construction: 2014–2018

Size: 5,500 m² (prefab slab); 1,200 m² (canteen)

Cost: €6.5 million (prefab slab); €1.5 million (canteen)

Process:

- 2014 Commissioning and start of planning
- 2017: Start of construction
- 2018: Completion

Developer: Axel Schukies / Sendlinger Conrads GbR

Urban planning and architecture: Petersen

Architekten GmbH, Berlin

Structural design: Ingenieurbüro Horn GmbH, Leipzig

General contractor/construction management: Realace GmbH, Berlin

Awards: ICONIC Award 2020; Bauherrenpreis Berlin 2019

Further information:

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Lange-Feld-Straße Railway Bridge (p. 57)

Location: Lange-Feld-Straße, 30559 Hanover

Objectives and measures: Renewal of the listed bridge construction according to the current technical and infrastructure requirements while safeguarding the historical appearance and original structural fabric

Uses: Double track railway bridge

Planning, design and construction: 2011–2019

Cost: €7.0 million

Process:

- 2011: Start of planning
- 2016: Start of construction
- 2017: Put into service
- 2019: Completion

Developer: DB Netz AG, Hanover

Structural design: MKP – Marx Krontal Partner GmbH

General contractor/construction management: ARGE SAM / GP Ingenieurbau

Final design: Ingenieurbüro für Verkehrsanlagen GmbH, Halle

Awards: Ingenieurbaupreis 2020 (Honorary mention)

Further information:

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Multipurpose Railway Station, “Bürgerbahnhof” Cuxhaven (p. 58)

Location: Am Bahnhof 1, 27472 Cuxhaven

Objectives and measures: Maintenance and renovation of the Cuxhaven railway station building as a landmark structure, mobility centre and services location

Uses: Public station concourse with ticket machines, lockers, toilets, café and restaurant, DB travel centre, bookshop, bus company, tourist information, car and bicycle hire, shops, meeting and conference room for companies, clubs, associations, and private parties, social rooms for the personnel of the transport companies, taxi company, advertising agency, workshop, offices, advisory and recreational

rooms of a youth welfare association, premises of the regional transport company

Planning, design and construction: 2013–2019

Size: approx. 1,400 m²

Costs: approx. €5.3 million

Financing, funding: Cooperative shares (equity); bank and private loans; funds from Landesnahverkehrsgesellschaft Niedersachsen mbH

Process:

- 2012: Formation of the "Bahnhofsinitiative Cuxhaven" railway station initiative and implementation of a design engagement workshop (ideas competition)
- 2013: Formation of the cooperative, commissioning of the feasibility study and start of design
- 2017: Start of construction
- 2018: Completion and putting into service

Developer: Bürgerbahnhof Cuxhaven eG, Cuxhaven

Architecture: Agentur BahnStadt / stationova GmbH, Berlin

Site Supervision: stationova GmbH, Berlin, and a site engineer on site

Awards: Certificate issued by the Town of Cuxhaven on the opening of the first multipurpose railway station ("Bürgerbahnhof") in Lower Saxony; Special "Bahnhof des Jahres 2019" prize of the "Allianz pro Schiene"; Schlossmedaillen of the City of Cuxhaven for voluntary engagement awarded to two initiators and board members of Bürgerbahnhof Cuxhaven eG

Further information:

- Website of the Bürgerbahnhof: <https://buerbahn-bahnhof-cuxhaven.de/> (Retrieved 06/2022)
- Bürgerbahnhof Cuxhaven eG (o. J.): Bürgerbahnhof Cuxhaven. Festschrift zur Eröffnung. Cuxhaven.

Wittenberg Castle (p. 70)

Location: Schloßplatz, 06886 Lutherstadt Wittenberg

Project: Conversion, extension and renovation of the Renaissance castle

Uses: Visitors' centre, cultural history tour, exhibition, research library, seminary

Planning, design and construction: 2011–2017

Size: 10,538 m² gross floor area

Cost: €17.17 million (gross)

Financing, funding: Funds from the European Regional Development Fund and the State of Saxony-Anhalt

Process:

- 2011: Competition, commissioning and start of design
- 2012: Start of construction
- 2017: Completion

Developer: Lutherstadt Wittenberg

Urban planning and architecture: Bruno Fioretti Marquez GmbH, Berlin (ARGE Sanierung Schloss Wittenberg)

Structural design: ifb – Frohloff Staffa Kühl Ecker Beratende Ingenieure PartG mbB, Berlin (ARGE Sanierung Schloss Wittenberg)

Site supervision: AADe – Atelier für Architektur & Denkmalpflege Stuve Architekten, Dessau (ARGE Sanierung Schloss Wittenberg); DGI Bauwerk Architekten GmbH, Berlin/Hamburg/Frankfurt

Building services: INNIUS DÖ GmbH, Dresden

Fire protection: Sachverständigenbüro Arnhold, Weimar

Awards: Deutscher Architekturpreis 2019; ECOLA Award 2019; Mies van der Rohe Award 2019 (Nomination); "Respekt und Perspektive" – Bauen im Bestand Preis 2018; Deutscher Städtebaupreis 2018 (Honorary Mention); Hannes-Meyer-Preis BDA

2018 (Honorary Mention); DAM-Preis 2018 (Shortlist)

More information:

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Rathaus Korbach (p. 74)

Objectives and measures: Redesign of the central area of the town with the "Rathaus" (town hall) and its historical surroundings for the purpose of neighbourhood-related town repair and urban planning reorganisation of the whole site

Planning, design and construction: 2017–2022

Size: 6,996 m² gross floor area

Cost: €20.7 million net (cost groups 300 + 400 + 500)

Process:

- 2017: Competition, commissioning and start of design
- 2019: Start of construction
- 2022: Completion

Developer: Kreis- und Hansestadt Korbach

Urban planning, architecture, landscape design and site supervision: ARGE agn heimspielarchitekten

Structural design: EFG Beratende Ingenieure

GmbH, Fuldaerbrück

Urban mining concept: Anja Rosen / energum GmbH, Ibbenbüren, and Harald Kurkowski / Bimolab GmbH, Soest

Further information:

- Hansstadt Korbach (o. J.): Rathausneubau – Vom Abriss bis zur Einweihung. Online at: <https://www.korbach.de/Die-Stadt/Aktuelles-Infos/Rathausneubau/> (Retrieved 06/2022)
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Children and Youth Centre in the Former Signal Tower (p. 77)

Location: Holzstraße 60, 65197 Wiesbaden

Objectives and measures: Conversion of a former signal tower in Wiesbaden

Uses: Children and youth centre, after-school care, activity days

Planning, design and construction: 2018–2020

Size: 120 m²

Cost: Euro 350,000

Financing, funding: IKEA-Stiftung, Hofheim-Wallau

Developer: CASA e. V. – Centrum für aktivierende Stadtteilarbeit, Wiesbaden

Urban planning, architecture and landscape design: A-Z Architekten BDA, Wiesbaden

Structural design: KSP – Kuys + Spitzhorn Ingenieurgesellschaft mbH, Wiesbaden

General contractor/construction management: A-Z Architekten BDA, Wiesbaden

Awards: Auszeichnung Vorbildlicher Bauten im Land Hessen 2020; DMK Award für Nachhaltiges Bauen 2021 (Special award); Tag der Architektur 2020, 2021, 2022

Further information:

- AKH – Architekten- und Stadtplanerkammer Hessen (o. J.): Kinder- und Jugendtreff im ehemaligen Stellwerk. Online at: <https://www.akh.de/baukultur/preisverleihung/kinder-und-jugendtreff-im-ehemaligen-stellwerk> (Retrieved 06/2022)

"Haus der Jugend" Youth Centre (p. 78)

Location: Westliche Karl-Friedrich-Straße 77, 75172 Pforzheim

Objectives and measures: Renovation of a building erected in 1949, including addition of another storey

Uses: Children and youth centre

Planning, design and construction: 2016–2019

Size: 1,453 m²

Cost: €4.0 million

Financing, funding: Federal programme for the "Renovation of municipal sport, youth and culture facilities"

Process:

- 2016: Competition in VOF procedure for freelance services, commissioning and start of design
- 2017: Start of construction
- 2019: Completion

Developer / Urban Planning: City of Pforzheim, building management

Architecture: VON M GmbH, Stuttgart

Structural design: Rainer Klein Ingenieurbüro für Bauwesen, Sachsenheim

Site supervision: Burkhard Meyer Architekt, Karlsruhe

Building physics: Kurz + Fischer GmbH, Winnenden

Electrical design: Ingenieurbüro Wörtz, Pforzheim

Further information:

- Wessely, Heide (2022): Haus der Jugend in Pforzheim. Beitrag vom 06.04.2022. In: Detail. Munich. Online at: https://www.detail.de/de/de_de/haus-der-jugend-in-pforzheim (Retrieved 06/2022)
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"Ausbauhaus Südkreuz" Apartment Building (p. 82)

Location: Gotenstraße 41, 10829 Berlin

Objectives and measures: Construction of a new housing project in which the interior finishes, fixtures and fittings are planned with renewable and composite-free materials and with an option for alterations at a later date

Uses: Collaborative housing project for a group of owners with apartments for self-use and funded units, neighbourhood-based trade, communal room

Planning, design and construction: 2019–2022

Size: 2,200 m² gross floor area

Cost: €4.1 million gross (cost group 300 + 400)

Financing, funding: KfW funding for "Effizienzhaus 40"; KfW loans through Umweltbank

Process:

- 2018: Contract award in "concept procedure" (public land sold for implementation of an approved, innovative use concept)
- 2019: Commissioning and start of design
- 2020: Start of construction
- 2022: Completion

Developer: Baugruppe Ausbauhaus Südkreuz GbR, Berlin

Architecture and site supervision:

Praeger Richter Architekten GmbH, Berlin

Landschaftsarchitektur: hutterreimann Landschaftsarchitektur GmbH, Berlin

Structural design: Steffen Janitz Ingenieurbüro, Guben

Project management: mrp – Müller Rose

Projektsteuerung, Berlin, and L.I.S.T. – Lösungen im

Stadtteil Stadtentwicklungsgesellschaft mbH, Berlin

Building services: PSW Ingenieurteam, Berlin

Timber, façade and roofing works: Zimmerei

Feuerbach GmbH, Berlin

Awards: Re-Use am Bau 2022

Further information:

- Richter, Jana (2022): Ausbauhaus Südkreuz. Vortrag vom 06.05.2022. Online at: <https://www.youtube.com/watch?v=Z4X5gv613g> (Retrieved 06/2022)

Research Houses in Bad Aibling (p. 84)

Location: Dietrich-Bonhoeffer-Straße 5, 83043 Bad Aibling

Objectives and measures: "Simply Build" research houses

Uses: Rental apartments

Planning, design and construction: 2018–2020

Size: 650 m² gross floor area per building

Cost: Masonry: 1,493 €/m² GFA; timber: 1,730 €/m² GFA; lightweight concrete: 2,039 €/m² GFA (cost groups 300 + 400 net)

Process:

- 2018: Commissioning and start of design
- 2019: Start of construction
- 2020: Completion

Developer and landscape design: B & O Gruppe, Bad Aibling

Urban planning, architecture and site supervision: Florian Nagler Architekten GmbH, Munich

Tragwerksplanung: merz kley partner GmbH, Dornbirn

Energy concept: Transsolar Energietechnik GmbH, Stuttgart

Building physics: Ingenieurbüro für Haustechnik Horstmann + Berger, Altensteig

Fire protection: PHlplan, Grabenstätt/Munich

Advice and support: Technische Universität

München – "Simply Build" Research Centre

Awards: Deutscher Nachhaltigkeitspreis 2021; BDA Architekturpreis Nike 2022; BDA Preis Bayern 2022; DAM-Preis 2021 (Finalist)

Further information:

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- Lembke, Judith (2020): So einfach kann Bauen sein. Beitrag vom 04.12.2020. In: *Frankfurter Allgemeine Zeitung*. Frankfurt am Main.

Offices for Members of Parliament in the Luisenblock Building (p. 87)

Location: Adele-Schreiber-Krieger-Straße 6, 10117 Berlin

Objectives and measures: Erection of a modular office building for the Deutscher Bundestag (German parliament)

Uses: Office use

Planning, design and construction: 2020–2021

Size: approx. 17,100 m² gross floor area

Cost: €70 million

Process:

- 2020: Competition, commissioning, start of design and start of construction
- 2021: Completion

Developer: Deutscher Bundestag / Bundesamt für Bauwesen und Raumordnung (BBR)

Architecture: Sauerbruch Hutton, Berlin

Landscape architecture: Sinai Gesellschaft von Landschaftsarchitekten mbH, Berlin/Frankfurt am Main

Structural design: Wetzels & von Seht Ingenieurbüro für Bauwesen, Hamburg/Berlin

General contractor/construction management: Kaufmann Bausysteme GmbH, Reuthe, and Primus Developments, Hamburg

Building physics: Drees & Sommer SE, Stuttgart

Fire protection: Dekra Automobil GmbH – Industrie, Bau und Immobilien, Hamburg

Further information:

- Bundesamt für Bauwesen und Raumordnung (o. J.): Deutscher Bundestag – Luisenblock West. Online at: <https://www.bbr.bund.de/BBR/DE/Bauprojekte/Berlin/Politik/DBT/Luisenblock-west/neubau-buerogebaeude.html> (Retrieved 06/2022)
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- Matzig, Gerhard (2021): Mehr als nur bunt. Beitrag vom 30.12.2021. In: *Süddeutsche Zeitung*. Munich.

Foundation Headquarters in Potsdam (p. 100)

Location: Schiffbauergasse 3, 14467 Potsdam

Project: Federal Foundation of Baukultur (BSBK)

Objectives and measures: Conversion of a former barracks building into the foundation's main offices, emblematic addition of an open top floor

Uses: Main offices of the Federal Foundation of Baukultur

Planning, design and construction: 2008–2011

Size: 688 m²

Cost: €1.037 million net (cost groups 300 + 400)

Financing, funding: Federal funds

Process:

- 2008: Competition and start of planning
- 2010: Start of construction
- 2011: Completion

Developer: City of Potsdam, represented by Pro Potsdam GmbH

Architecture: Springer Architekten GmbH with Georg Heidenreich, Berlin

Landscape architecture: Weidinger Landschaftsarchitekten GmbH, Berlin/Hanover

Structural design: Ingenieurbüro Rüdiger Jockwer GmbH, Berlin

Site supervision: Springer Architekten GmbH with Georg Heidenreich, Berlin

Building services: Planungsbüro Dernbach GmbH, Berlin

Awards: Fritz-Höger-Preis 2014 (Special Mention); BDA Preis Brandenburg 2012

Further information:

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- Schultz, Brigitte (2008): Sitz der Bundesstiftung Baukultur in Potsdam. In: *Bauwelt* 28/2008. Berlin.

Eiermann Building in Apolda (p. 106)

Location: Auenstraße 11, 99510 Apolda

Objectives and measures: After standing empty for over twenty years, the listed production building was repurposed and developed as the Open Factory, an initiative project of the IBA Thuringia, by minimum invasive collective and curated reprogramming

Uses: Workshops, studios, ateliers, offices, temporary event spaces for commercial-cultural uses with a focus on sustainable local added value

Planning, design and construction: 2018–2022

Size: 6,294 m² gross floor area

Costs: approx. €3.64 million

Financing, funding: Federal Ministry for Housing, Urban Development and Building; Thuringia Ministry for Infrastructure and Agriculture; IBA Thuringia; Deutsche Stiftung Denkmalschutz (German Foundation for Monument Protection); Thuringia Staatskanzlei (State Chancellery); Rotary Club of Apolda-Weimarer Land; Wüstenrot Stiftung

Process:

- 2014: Pre-project phase
- 2016: Development of model as part of the IBA Campus
- 2018: Start of design and construction
- 2019: Trial use as the Hotel Egon
- 2021: Participation process for the development of an outdoor space concept
- 2022: Participation process on sustainable textile design and start of conversion

Developer: Internationale Bauausstellung Thüringen GmbH, Apolda

Architecture: Internationale Bauausstellung Thüringen, Apolda, Katja Fischer and Tobias Haag

Landscape architecture: Station C23 Architekten und Landschaftsarchitekten PartG mbB, Leipzig

Site supervision, fire protection and structural design: Ingenieurbüro Matthias Münz, Weimar

Air-conditioning and heating concept: Prof. Dr. Elisabeth Endres / Ingenieurbüro Hausladen GmbH, Kirchheim

Awards: immobilienmanager-Award 2021 (Top 3); DAM-Preis 2020 (Nomination); AIT-Award 2020

Further information:

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forsa Politik- und Sozialforschung GmbH conducted a representative survey on the topic of Baukultur and conversion of cities and buildings on behalf of the Federal Foundation of Baukultur. For the purposes of the study, a total of 1,202 persons, selected by a systematic random process, aged 14 years and older in private households in Germany were surveyed. The survey was conducted as an online survey from 14 to 31 October 2021 with the assistance of the representative survey panel, forsa.omninet. The results determined can only be applied to the population as a whole in Germany aged 14 years and older with the margins of error possible in all sample surveys (in this case +/- 3 percentage points).

P1 Associations with the term "conversion"

P1a Associations with the term "conversion" (I)

When the respondents hear or read the term "conversion", they think of... *

	in total	14 to 29 years old	30 to 44 years old	45 to 59 years old	60 years and older
Renewal and improvement	82 %	80 %	80 %	83 %	82 %
Lots of dust and work	58 %	49 %	60 %	64 %	58 %
Projects in which occupants lend a helping hand	47 %	50 %	56 %	48 %	39 %
Old, dilapidated buildings	32 %	35 %	36 %	29 %	29 %
Long construction periods	27 %	40 %	28 %	24 %	22 %
Expensive construction sites	26 %	31 %	25 %	26 %	25 %
Interesting architecture	12 %	20 %	10 %	11 %	11 %

* Percentage higher than 100, as multiple responses were possible

P1b Associations with the term "conversion" (II)

When the respondents hear or read the term "conversion", they think of... *

	in total	Size of locality (inhabitants):				
		fewer than 5,000	5,000 up to under 20,000	20,000 up to under 100,000	100,000 up to under 500,000	500,000 or more
Renewal and improvement	82 %	84 %	80 %	81 %	81 %	83 %
Lots of dust and work	58 %	64 %	57 %	60 %	60 %	48 %
Projects in which occupants lend a helping hand	47 %	62 %	48 %	49 %	41 %	37 %
Old, dilapidated buildings	32 %	31 %	31 %	27 %	34 %	39 %
Long construction periods	27 %	30 %	27 %	23 %	32 %	27 %
Expensive construction sites	26 %	29 %	29 %	24 %	28 %	22 %
Interesting architecture	12 %	8 %	13 %	12 %	14 %	14 %

* Percentage higher than 100, as multiple responses were possible

P2 Wanted changes to their own housing situation

P2a Wanted changes to their own housing situation (I)

If the respondents could change their housing situation, they would want... *

	Yes	No	Already exists
A visual redesign	53 %	35 %	9 %
Additional rooms	37 %	46 %	15 %
More living space	34 %	46 %	19 %
More nature near housing	25 %	14 %	60 %
Own garden	25 %	16 %	58 %
A balcony	20 %	30 %	50 %
A more rural place to live	16 %	40 %	43 %
A more central place to live	12 %	50 %	35 %
Less living space	10 %	85 %	3 %

* Responses less than 100 percent = "don't know"

P2b Wanted changes to their own housing situation (II)

If the respondents could change their housing situation, they would want... *

	in total	14 to 29 years old	30 to 44 years old	45 to 59 years old	60 years and older
A visual redesign	53 %	57 %	55 %	61 %	42 %
Additional rooms	37 %	51 %	63 %	30 %	16 %
More living space	34 %	50 %	56 %	28 %	15 %
More nature near housing	25 %	37 %	32 %	20 %	18 %
Own garden	25 %	37 %	38 %	20 %	13 %
A balcony	20 %	33 %	19 %	16 %	14 %
A more rural place to live	16 %	23 %	19 %	15 %	10 %
A more central place to live	12 %	13 %	12 %	11 %	12 %
Less living space	10 %	6 %	5 %	11 %	15 %

P2c Wanted changes to their own housing situation (III)

If the respondents could change their housing situation, they would want... *

	in total	Size of locality (inhabitants):				
		fewer than 5,000	5,000 up to under 20,000	20,000 up to under 100,000	100,000 up to under 500,000	500,000 or more
A visual redesign	53 %	59 %	52 %	54 %	49 %	48 %
Additional rooms	37 %	32 %	34 %	35 %	36 %	48 %
More living space	34 %	24 %	31 %	30 %	37 %	51 %
More nature near housing	25 %	17 %	18 %	26 %	29 %	39 %
Own garden	25 %	22 %	16 %	22 %	33 %	39 %
A balcony	20 %	15 %	17 %	22 %	22 %	21 %
A more rural place to live	16 %	9 %	12 %	15 %	20 %	24 %

A more central place to live	12 %	15 %	14 %	12 %	8 %	8 %
Less living space	10 %	14 %	12 %	12 %	6 %	6 %

P3 Wanted changes to improve the appearance of the location

P3a Wanted changes to improve the appearance of the city / the location (I)

Respondents who would want to make the city / the location in which they live or shop more attractive:

	in total	14 to 29 years old	30 to 44 years old	45 to 59 years old	60 years and older
Renovation of dilapidated buildings	79 %	75 %	80 %	79 %	81 %
Fewer vacant shop areas	76 %	71 %	71 %	79 %	79 %
More diverse use of the town centre (housing, culture and shopping)	71 %	69 %	68 %	74 %	72 %
Better bicycle paths	70 %	75 %	73 %	65 %	70 %
More meetings points and recreational/leisure locations	64 %	65 %	68 %	65 %	60 %
More spaces for nature	60 %	69 %	61 %	60 %	54 %
More parks and green spaces	54 %	64 %	60 %	51 %	45 %
More apartments	45 %	41 %	50 %	38 %	49 %
No other new development areas	44 %	38 %	45 %	45 %	46 %
More water areas	43 %	53 %	48 %	45 %	33 %
Less car traffic and fewer parking spaces	36 %	47 %	34 %	29 %	38 %
Demolition of old buildings and construction of new ones	26 %	26 %	25 %	25 %	26 %

P3b Wanted changes to improve the appearance of the city / the location (II)

Those who would want to make the location in which they live or shop more attractive:

	Size of locality (inhabitants):					
	in total	fewer than 5,000	5,000 up to under 20,000	20,000 up to under 100,000	100,000 up to under 500,000	500,000 or more
Renovation of dilapidated buildings	79 %	81 %	73 %	80 %	80 %	82 %
Fewer vacant shop areas	76 %	71 %	68 %	81 %	82 %	74 %
More diverse use of the town centre (housing, culture and shopping)	71 %	74 %	74 %	75 %	72 %	57 %
Better bicycle paths	70 %	69 %	67 %	76 %	71 %	64 %
More meetings points and recreational/leisure locations	64 %	67 %	65 %	68 %	65 %	51 %
More spaces for nature	60 %	48 %	52 %	63 %	74 %	65 %

More parks and green spaces	54 %	47 %	47 %	54 %	64 %	59 %
More apartments	45 %	39 %	41 %	46 %	44 %	54 %
No other new development areas	44 %	44 %	42 %	43 %	47 %	45 %
More water areas	43 %	39 %	42 %	44 %	47 %	44 %
Less car traffic and fewer parking spaces	36 %	32 %	30 %	38 %	36 %	47 %
Demolition of old buildings and construction of new ones	26 %	32 %	27 %	24 %	27 %	19 %

P4 Wanted infrastructure offers in the city centre

Those who find it good if the respective offer is available in the city centre:

	Yes	No, not good *
Libraries	91 %	4 %
Housing	89 %	9 %
Schools	87 %	11 %
Other educational offers, e.g. adult education centres	87 %	9 %
Kindergartens/child daycare centres	86 %	12 %
Universities	73 %	21 %
Commerce / skilled trade businesses	71 %	25 %
Industry, if it does not cause any noise or dirt	40 %	54 %
Logistics areas, large warehouses, etc.	10 %	85 %

* Responses less than 100 percent = "don't know"

P5 Conversion of living spaces due to climate change

P5a Important aspects of conversion of living spaces due to climate change (I)

The following offers for conversion of living spaces due to climate change are ... *

	Very important	Important	Less important	Not at all important
Unsealing areas so that precipitation can infiltrate and percolate into the ground	55 %	36 %	6 %	1 %
Flood protection measures	51 %	38 %	7 %	2 %
More green and open spaces	50 %	43 %	5 %	0 %
More street trees / tree planting	50 %	39 %	8 %	1 %
Protected areas specifically for the preservation of biodiversity	47 %	38 %	10 %	1 %
Roof and façade greening	31 %	42 %	21 %	4 %
Surfacings that help against overheating	30 %	47 %	15 %	3 %
Roofs that provide shade	23 %	44 %	26 %	3 %
More water areas, water features, fountains, etc.	20 %	41 %	32 %	5 %

* Responses less than 100 percent = "don't know"

P6b Important aspects of conversion of living spaces due to climate change (II)

The following offers for conversion of living spaces due to climate change are very important:

	in total	14 to 29 years old	30 to 44 years old	45 to 59 years old	60 years and older
Unsealing areas so that precipitation can infiltrate and percolate into the ground	55 %	49 %	52 %	57 %	59 %
Flood control structures	51 %	42 %	47 %	54 %	58 %
More green and open spaces	50 %	54 %	57 %	54 %	41 %
More street trees / tree planting	50 %	58 %	50 %	53 %	44 %
Protected areas specifically for the preservation of biodiversity	47 %	58 %	48 %	48 %	40 %
Roof and façade greening	31 %	36 %	35 %	31 %	25 %
Surfacings that help against overheating	30 %	31 %	30 %	33 %	26 %
Roofs that provide shade	23 %	17 %	22 %	26 %	24 %
More water areas, water features, fountains, etc.	20 %	19 %	19 %	24 %	18 %

P6 What comes to mind when thinking of a typical business park

When the respondents imagine a typical business park, they spontaneously think of:*

	in total	14 to 29 years old	30 to 44 years old	45 to 59 years old	60 years and older
A better link to local public transport would be needed	52 %	48 %	54 %	52 %	54 %
Is practical	52 %	45 %	51 %	53 %	55 %
Is not really part of the city	48 %	54 %	44 %	47 %	49 %
I would not like to walk or bicycle here	36 %	38 %	33 %	35 %	37 %
Looks good	3 %	4 %	2 %	2 %	3 %

* Percentage higher than 100, as multiple responses were possible

P7 Dealing with dilapidated railway station buildings

P7a Do they know of a dilapidated railway station building?

Know of a dilapidated railway station building: *

	Yes	No
in total	57 %	41 %
East **	72 %	28 %
North **	47 %	51 %
North Rhine-Westphalia	50 %	47 %
Central **	62 %	35 %

South **	55 %	43 %
Men	60 %	38 %
Women	54 %	44 %
14 to 29 years old	67 %	33 %
30 to 44 years old	64 %	35 %
45 to 59 years old	55 %	43 %
60 years and older	48 %	49 %
Size of locality (inhabitants):		
fewer than 5,000	63 %	35 %
5,000 up to under 20,000	56 %	42 %
20,000 up to under 100,000	52 %	46 %
100,000 up to under 500,000	60 %	35 %
500,000 or more	58 %	42 %

* Responses less than 100 percent = "don't know"

** East = Berlin, Brandenburg, Mecklenburg-Western Pomerania, Saxony, Saxony Anhalt, Thuringia
North = Bremen, Hamburg, Lower Saxony, Schleswig-Holstein
Central = Hesse, Rhineland Palatinate, Saarland
South = Baden-Württemberg, Bavaria

P7b Favoured handling of dilapidated railway station buildings *

This dilapidated railway station building should be ...:

	Demolished	Restored as a railway station building	Renovated and used otherwise	Left in its current condition
in total	10 %	29 %	58 %	2 %
East	7 %	35 %	57 %	1 %
North	5 %	26 %	66 %	2 %
North Rhine-Westphalia	17 %	23 %	57 %	3 %
Central	10 %	29 %	57 %	4 %
South	11 %	29 %	57 %	3 %
Men	11 %	28 %	58 %	3 %
Women	9 %	31 %	59 %	1 %
14 to 29 years old	12 %	25 %	57 %	6 %
30 to 44 years old	12 %	31 %	54 %	3 %
45 to 59 years old	9 %	27 %	63 %	1 %
60 years and older	8 %	32 %	58 %	0 %
Size of locality (inhabitants):				
fewer than 5,000	7 %	26 %	62 %	5 %
5,000 up to under 20,000	11 %	33 %	52 %	4 %
20,000 up to under 100,000	11 %	32 %	57 %	0 %
100,000 up to under 500,000	12 %	29 %	57 %	2 %
500,000 or more	9 %	22 %	67 %	3 %

* Basis: Respondents who know of a dilapidated railway station building

** Responses less than 100 percent = "don't know"

P8 Features of a good railway station

The following features and offers of a railway station are...: *

	Very important	Important	Less important	Not at all important
Easy orientation	66 %	32 %	1 %	0 %
Different local public transport offers gathered together in one place	62 %	34 %	2 %	0 %
A functioning transport station	61 %	34 %	2 %	0 %
Clean and maintained circulation paths and platforms	55 %	42 %	2 %	0 %
Pleasant recreational areas	39 %	55 %	5 %	0 %
Tourist information	35 %	48 %	15 %	1 %
Bicycle parking garages	32 %	50 %	13 %	3 %
Shopping facilities such as bakery, newspaper shop, etc.	30 %	55 %	13 %	1 %
Many parking spaces	29 %	52 %	15 %	3 %
A good design	24 %	59 %	15 %	1 %
An attractive station forecourt	18 %	53 %	26 %	2 %
Catering with seating	17 %	49 %	30 %	3 %
Car sharing offers	11 %	47 %	32 %	6 %
Municipal offers (e.g. citizens registration office, administration)	7 %	24 %	51 %	16 %
Other shopping facilities	6 %	28 %	55 %	10 %
Cultural offers (e.g. library, events)	4 %	17 %	56 %	21 %

* Responses less than 100 percent = "don't know"

P9 Important aspects of future mobility in the city**P9a Important aspects of future mobility in the city (I)**

For the future mobility in the city, the following aspects are...: *

	Very important	Important	Less important	Not at all important
Well-functioning local public transport	77 %	21 %	1 %	0 %
Safe footpaths	71 %	27 %	1 %	0 %
Safe halts/stops	59 %	37 %	2 %	0 %
Good bicycle network	55 %	35 %	7 %	2 %
Free-flowing traffic	41 %	48 %	8 %	1 %
Traffic calmed zones	35 %	45 %	15 %	3 %
Sufficient parking spaces	34 %	45 %	17 %	2 %
Sufficient e-charging stations	30 %	43 %	16 %	7 %
Attractive railway stations	22 %	56 %	19 %	1 %
Easy accessibility of sharing offers	20 %	47 %	22 %	7 %
Feasibility of autonomous driving	10 %	24 %	41 %	17 %
Fewer parking spaces	6 %	19 %	37 %	32 %

* Responses less than 100 percent = "don't know"

P9b Important aspects of future mobility in the city (II)

For the future mobility in the city, the following aspects are very important:

	in total	14 to 29 years old	30 to 44 years old	45 to 59 years old	60 years and older
Well-functioning local public transport	77 %	81 %	76 %	78 %	74 %
Safe footpaths	71 %	70 %	73 %	68 %	73 %
Safe halts/stops	59 %	58 %	57 %	61 %	61 %
Good bicycle network	55 %	70 %	58 %	49 %	49 %
Free-flowing traffic	41 %	42 %	44 %	47 %	35 %
Traffic calmed zones	35 %	44 %	32 %	32 %	34 %
Sufficient parking spaces	34 %	30 %	37 %	37 %	33 %
Sufficient e-charging stations	30 %	26 %	28 %	33 %	31 %
Attractive railway stations	22 %	27 %	19 %	22 %	21 %
Easy accessibility of sharing offers	20 %	23 %	21 %	21 %	15 %
Feasibility of autonomous driving	10 %	14 %	14 %	8 %	7 %
Fewer parking spaces	6 %	10 %	9 %	3 %	4 %

P9c Important aspects of future mobility in the city (III)

For the future mobility in the city, the following aspects are very important:

	in total	Size of locality (inhabitants):				
		fewer than 5,000	5,000 up to 20,000	20,000 up to 100,000	100,000 up to 500,000	500,000 or more
Well-functioning local public transport	77 %	69 %	74 %	77 %	82 %	83 %
Safe footpaths	71 %	68 %	68 %	73 %	74 %	74 %
Safe halts/stops	59 %	55 %	60 %	58 %	63 %	63 %
Good bicycle network	55 %	53 %	54 %	58 %	57 %	53 %
Free-flowing traffic	41 %	47 %	41 %	39 %	43 %	39 %
Traffic calmed zones	35 %	33 %	35 %	37 %	37 %	33 %
Sufficient parking spaces	34 %	37 %	40 %	33 %	33 %	26 %
Sufficient e-charging stations	30 %	30 %	27 %	30 %	35 %	30 %
Attractive railway stations	22 %	21 %	21 %	22 %	24 %	22 %
Easy accessibility of sharing offers	20 %	18 %	16 %	20 %	21 %	23 %
Feasibility of autonomous driving	10 %	13 %	12 %	7 %	11 %	9 %
Fewer parking spaces	6 %	6 %	3 %	6 %	7 %	11 %

P10 Attitudes to the demolition or retention of buildings**P10a Regret the demolition of a building**

Those who have already regretted or been annoyed by the demolition of a building: *

	Yes	No
in total	52 %	42 %
East	59 %	37 %
North	58 %	36 %
North Rhine-Westphalia	46 %	49 %
Central	48 %	47 %
South	52 %	43 %
Men	51 %	45 %
Women	53 %	41 %
14 to 29 years old	48 %	47 %
30 to 44 years old	45 %	49 %
45 to 59 years old	56 %	40 %
60 years and older	57 %	38 %
Size of locality (inhabitants):		
fewer than 5,000	52 %	46 %
5,000 up to under 20,000	49 %	46 %
20,000 up to under 100,000	54 %	41 %
100,000 up to under 500,000	47 %	46 %
500,000 or more	60 %	34 %

* Responses less than 100 percent = "don't know"

P10b When does the demolition of a building disturb you? *

If a building is demolished and disappears, it is disturbing ... **

	In a very general sense	Only in the case of particularly old, important or attractive buildings	Only if further use or conversion were possible
in total	5 %	74 %	53 %
East	7 %	67 %	58 %
North	3 %	74 %	47 %
North Rhine-Westphalia	4 %	76 %	55 %
Central	11 %	74 %	45 %
South	2 %	78 %	53 %
Men	5 %	76 %	50 %
Women	5 %	72 %	55 %
14 to 29 years old	7 %	81 %	50 %
30 to 44 years old	2 %	67 %	58 %

45 to 59 years old	5 %	74 %	50 %
60 years and older	6 %	73 %	53 %

Size of locality (inhabitants):

fewer than 5,000	2 %	75 %	57 %
5,000 up to under 20,000	8 %	73 %	47 %
20,000 up to under 100,000	4 %	75 %	49 %
100,000 up to under 500,000	4 %	76 %	55 %
500,000 or more	6 %	70 %	61 %

* Basis: Respondents who have already regretted or have been annoyed by the demolition of a building
** Percentage higher than 100, as multiple responses were possible

P10c Wish for information in case of the pending demolition of a building

Those that would like to be informed about the pending demolition of buildings in their city or neighbourhood: *

	Yes	No
in total	57 %	35 %
East	59 %	32 %
North	64 %	30 %
North Rhine-Westphalia	57 %	36 %
Central	50 %	42 %
South	56 %	37 %
Men	59 %	36 %
Women	56 %	35 %
14 to 29 years old	64 %	31 %
30 to 44 years old	54 %	42 %
45 to 59 years old	53 %	39 %
60 years and older	58 %	31 %

Size of locality (inhabitants):

fewer than 5,000	49 %	43 %
5,000 up to under 20,000	54 %	39 %
20,000 up to under 100,000	57 %	35 %
100,000 up to under 500,000	61 %	31 %
500,000 or more	65 %	28 %

* Responses less than 100 percent = "don't know"

P10d Assessment of buildings for quality and conversion potential before demolition?

Buildings should be assessed for their quality and conversion potential before being demolished: *

	Yes	No
in total	88 %	9 %

East	88 %	9 %
North	91 %	8 %
North Rhine-Westphalia	91 %	5 %
Central	86 %	7 %
South	85 %	12 %
Men	86 %	11 %
Women	90 %	6 %
14 to 29 years old	85 %	14 %
30 to 44 years old	86 %	11 %
45 to 59 years old	87 %	9 %
60 years and older	92 %	4 %
Size of locality (inhabitants):		
fewer than 5,000	83 %	12 %
5,000 up to under 20,000	86 %	11 %
20,000 up to under 100,000	92 %	6 %
100,000 up to under 500,000	88 %	6 %
500,000 or more	88 %	9 %

* Responses less than 100 percent = "don't know"

P10e Preference for retaining a building rather than demolition

Preference should be given to retaining a building rather than demolishing it: *

	Yes, definitely	More likely yes	No, more likely not	No, definitely not
in total	28 %	54 %	10 %	1 %
East	33 %	54 %	9 %	0 %
North	25 %	57 %	9 %	1 %
North Rhine-Westphalia	28 %	54 %	7 %	1 %
Central	29 %	48 %	17 %	0 %
South	24 %	56 %	11 %	1 %
Men	24 %	57 %	13 %	0 %
Women	32 %	51 %	8 %	1 %
14 to 29 years old	28 %	54 %	12 %	0 %
30 to 44 years old	28 %	48 %	14 %	1 %
45 to 59 years old	28 %	52 %	9 %	1 %
60 years and older	27 %	59 %	8 %	0 %
Size of locality (inhabitants):				
fewer than 5,000	29 %	50 %	11 %	2 %
5,000 up to under 20,000	23 %	57 %	13 %	0 %
20,000 up to under 100,000	27 %	56 %	10 %	1 %
100,000 up to under 500,000	31 %	51 %	8 %	0 %
500,000 or more	32 %	52 %	9 %	0 %

* Responses less than 100 percent = "don't know"

P11 Opinions on the topic of the conversion of buildings

Those who agree with the respective statement: *

	Completely	More likely	More likely not	Not at all
Conversion projects should be encouraged/supported more.	36 %	50 %	6 %	2 %
An old, converted house is more individual than a new building.	34 %	41 %	16 %	4 %
A conversion fits better into its environment than new buildings.	28 %	51 %	13 %	2 %
Retaining existing buildings is better for climate protection than building new ones.	24 %	41 %	20 %	3 %
The conversion of buildings is usually very complicated.	16 %	51 %	24 %	2 %
Converting an old house is less expensive than a new building	3 %	23 %	46 %	13 %

* Responses less than 100 percent = "don't know"

P12 Opinions on the architecture currently being created in Germany

The architecture currently being created in Germany...: *

	I really like it	I mostly like it	I like it sometimes	I mostly don't like it
in total	1 %	25 %	55 %	13 %
East	1 %	25 %	53 %	16 %
North	0 %	26 %	53 %	12 %
North Rhine-Westphalia	0 %	26 %	55 %	15 %
Central	0 %	25 %	56 %	13 %
South	1 %	25 %	57 %	12 %
Men	1 %	26 %	55 %	14 %
Women	0 %	25 %	55 %	13 %
14 to 29 years old	2 %	29 %	48 %	14 %
30 to 44 years old	0 %	27 %	54 %	12 %
45 to 59 years old	0 %	23 %	58 %	14 %
60 years and older	0 %	24 %	58 %	13 %
Size of locality (inhabitants):				
fewer than 5,000	0 %	27 %	55 %	13 %
5,000 up to under 20,000	1 %	28 %	53 %	10 %
20,000 up to under 100,000	1 %	22 %	57 %	15 %
100,000 up to under 500,000	0 %	30 %	54 %	11 %
500,000 or more	0 %	23 %	53 %	18 %

* Responses less than 100 percent = "don't know"

P13 Important aspects of a nearby construction project

The following aspects of a nearby construction project are... *

	Very important	Important	Less important	Not at all important
A visually attractive result	39 %	54 %	5 %	0 %
As little noise and dust impact as possible	31 %	48 %	18 %	1 %
A future improvement for my neighbourhood	30 %	56 %	9 %	1 %
Adequate information in advance	26 %	52 %	17 %	2 %
The shortest possible construction period	24 %	48 %	25 %	1 %
The least possible change to the existing situation	15 %	40 %	35 %	5 %

* Responses less than 100 percent = "don't know"

P14 Design of infrastructure structures**P14a Attractive design of roads and bridges**

Respondents who think that infrastructure structures such as roads or bridges should also be designed to be visually attractive: *

	Yes	No
in total	80 %	15 %
East	83 %	14 %
North	79 %	14 %
North Rhine-Westphalia	76 %	17 %
Central	82 %	13 %
South	82 %	16 %
Men	79 %	18 %
Women	82 %	12 %
14 to 29 years old	73 %	21 %
30 to 44 years old	73 %	23 %
45 to 59 years old	83 %	13 %
60 years and older	88 %	8 %

Size of locality (inhabitants):

fewer than 5,000	84 %	14 %
5,000 up to under 20,000	78 %	17 %
20,000 up to under 100,000	81 %	14 %
100,000 up to under 500,000	81 %	14 %
500,000 or more	81 %	15 %

* Responses less than 100 percent = "don't know"

P14b Assessment of the design of infrastructure structures in Germany

Respondents who think that most infrastructure structures in Germany are currently well designed: *

	Yes	No
in total	27 %	55 %
East	32 %	51 %
North	22 %	57 %
North Rhine-Westphalia	24 %	58 %
Central	18 %	62 %
South	32 %	51 %
Men	26 %	60 %
Women	27 %	51 %
14 to 29 years old	29 %	58 %
30 to 44 years old	29 %	55 %
45 to 59 years old	25 %	59 %
60 years and older	25 %	50 %

Size of locality (inhabitants):

fewer than 5,000	30 %	53 %
5,000 up to under 20,000	28 %	52 %
20,000 up to under 100,000	27 %	56 %
100,000 up to under 500,000	24 %	55 %
500,000 or more	23 %	60 %

* Responses less than 100 percent = "don't know"

P14c Design competitions for engineering structures?

Engineering structures such as bridges should be subject to design competitions before they are built: *

	Yes, (almost) always	Yes, for particular structures	No
in total	15 %	64 %	17 %
East	14 %	71 %	12 %
North	15 %	65 %	15 %
North Rhine-Westphalia	13 %	61 %	20 %
Central	16 %	62 %	16 %
South	16 %	61 %	19 %
Men	14 %	66 %	17 %
Women	15 %	62 %	17 %
14 to 29 years old	12 %	62 %	20 %
30 to 44 years old	14 %	59 %	24 %
45 to 59 years old	16 %	62 %	17 %
60 years and older	16 %	70 %	11 %

Size of locality (inhabitants):			
fewer than 5,000	18 %	60 %	16 %
5,000 up to under 20,000	14 %	60 %	22 %
20,000 up to under 100,000	15 %	67 %	16 %
100,000 up to under 500,000	13 %	64 %	17 %
500,000 or more	15 %	69 %	12 %

* Responses less than 100 percent = "don't know"

P15 Importance of the Federal Foundation of Baukultur

It is important that, with the Federal Foundation of Baukultur, there is an institution that takes care of good planning, building and design throughout Germany: *

	Yes	No
in total	61 %	22 %
East	61 %	20 %
North	60 %	22 %
North Rhine-Westphalia	67 %	20 %
Central	59 %	20 %
South	58 %	25 %
Men	59 %	28 %
Women	62 %	16 %
14 to 29 years old	62 %	21 %
30 to 44 years old	59 %	24 %
45 to 59 years old	58 %	26 %
60 years and older	63 %	18 %
Size of locality (inhabitants):		
fewer than 5,000	57 %	26 %
5,000 up to under 20,000	62 %	23 %
20,000 up to under 100,000	57 %	23 %
100,000 up to under 500,000	62 %	18 %
500,000 or more	67 %	19 %

* Responses less than 100 percent = "don't know"

The Federal Foundation of Baukultur, with the support of the Deutscher Städtetag (Association of German Cities and Towns) and the Deutscher Städte- und Gemeindebund (Association of German Towns and Municipalities) surveyed the municipalities in Germany. The survey was conducted online from 1 November to 22 December 2021 and included the questionnaires completed by 331 municipalities in the analysis.

M1 Which of the following planning and building objectives is your municipality currently pursuing?*

Development of building plots in an integrated location	80 %
Designation of newbuild areas	72 %
Remedying urban planning shortcomings	62 %
Removal of vacant properties	54 %
Renovation of dilapidated buildings	48 %
Conversion of buildings	42 %
Qualification of meeting places and recreation areas	42 %
Conversion of infrastructures	35 %
Development of green spaces	32 %
Development of natural spaces	32 %
Newbuild replacement of buildings	30 %
Development of water areas	15 %
Other, i.e. including renovation/newbuild infrastructures, ecological measures	8 %

* Percentage higher than 100, as multiple responses were possible

M2 For the development of the city centre / the town centre of your municipality: Which of the following fields of action are currently an objective?*

Creation of housing	83 %
Creation of and/or redesign of green and open spaces	56 %
Establishment of kindergartens or child daycare centres	52 %
Creation of new trade offers	32 %
Integration of skilled trade businesses and low-impact commercial businesses/industry	25 %
Establishment of educational facilities, e.g. schools, universities	24 %
Conversion of department stores	11 %
Reduction of vacant office space	10 %
Integration of logistics areas, larger warehouses, etc.	3 %
None	2 %

* Percentage higher than 100, as multiple responses were possible

M3 Does your municipality have an integrated or spatial development concept, model or similar method for development of the city/town centre?

	in total	Towns/ cities	Rural municipalities
Yes, published within the last five years	26 %	35 %	19 %
Yes, published more than five years ago	21 %	28 %	15 %
Yes, updated within the past five years	9 %	12 %	7 %
Currently in progress	20 %	17 %	22 %
No	24 %	8 %	37 %

M4 Which of the following offers or measures regarding parked vehicles are pursued in your municipality?*

Park and ride car parks	25 %
Control by active parking space management	24 %
Reduction of parking spaces in the street/road space	23 %
Extension of parking spaces in the street/road space	20 %
Construction of neighbourhood garages	17 %
Construction of public underground car parks	8 %
None	37 %

* Percentage higher than 100, as multiple responses were possible

M5 How frequently are the following buildings and structures in your municipality affected by vacancy or do future vacancies loom?

	Very often	Often	Rarely	Never	None exist
in total					
Apartments in post-war housing developments	0 %	8 %	50 %	31 %	11 %
Detached houses in the town centre	1 %	8 %	46 %	40 %	5 %
Detached houses in housing developments from the 1960s to the 1990s	1 %	6 %	46 %	46 %	1 %
Retail properties in the city centre	4 %	27 %	46 %	10 %	13 %
Properties in local amenities on the edge of the town/city	0 %	6 %	36 %	27 %	31 %
Department stores and shopping malls	1 %	4 %	20 %	17 %	58 %
Office buildings	0 %	5 %	46 %	23 %	26 %
Larger commercial or industrial complexes	0 %	4 %	40 %	29 %	27 %
Towns/cities					
Apartments in post-war housing developments	1 %	6 %	57 %	34 %	2 %
Detached houses in the town centre	1 %	8 %	35 %	48 %	8 %
Detached houses in housing developments from the 1960s to the 1990s	1 %	4 %	44 %	50 %	1 %
Retail properties in the city centre	6 %	38 %	53 %	3 %	0 %
Properties in local amenities on the edge of the town/city	1 %	11 %	54 %	28 %	6 %
Department stores and shopping malls	2 %	8 %	36 %	20 %	34 %
Office buildings	1 %	9 %	68 %	17 %	5 %
Larger commercial or industrial complexes	1 %	6 %	58 %	26 %	9 %
Rural municipalities					
Apartments in post-war housing developments	0 %	10 %	44 %	29 %	17 %
Detached houses in the town centre	1 %	7 %	56 %	34 %	2 %
Detached houses in housing developments from the 1960s to the 1990s	2 %	6 %	47 %	43 %	2 %
Retail properties in the city centre	3 %	18 %	41 %	15 %	23 %
Properties in local amenities on the edge of the town/city	0 %	2 %	21 %	25 %	52 %

Department stores and shopping malls	0 %	1 %	6 %	15 %	78 %
Office buildings	0 %	1 %	27 %	29 %	43 %
Larger commercial or industrial complexes	0 %	4 %	24 %	31 %	41 %

M6 Does your municipality have business parks requiring development?

Yes, not only in inner-city areas but also commercial locations on the edge of the settlement	39 %
Yes, but only in commercial locations on the edge of the settlement	35 %
Yes, but only in the inner-city areas	3 %
No	23 %

M7 Re: question 6: If yes, how do you deal with the areas concerned?*

Building development through urban land-use planning	87 %
Building densification according to Sec. 34 BauGB (German Federal Building Code)	30 %
Upgrading of public spaces	28 %
Improvement of traffic access	24 %
Development into mixed neighbourhoods	23 %
Improvement of the local transport offer	21 %
Development of the proportion of green spaces, e.g. unsealing surfaces, roof greening	21 %
Active location management to use vacant properties	20 %
Development into a sustainable neighbourhood through new energy or heat supply concepts	17 %
Other, including the drawing up of development concepts, extending commercial areas, adaptation of infrastructure	6 %

* Percentage higher than 100, as multiple responses were possible

M8 Are there planning concepts or strategies in your municipality that examine the development of urban green spaces?

	in total	Towns/cities	Rural municipalities
Yes	34 %	50 %	21 %
No	47 %	29 %	62 %
Currently being planned	19 %	21 %	17 %

M9 Are there planning concepts or strategies in your municipality for the protection of biodiversity?

	in total	Towns/cities	Rural municipalities
Yes	39 %	53 %	28 %
No	42 %	28 %	54 %
Currently being planned	19 %	19 %	18 %

M10 Which of the following measures to protect biodiversity have been implemented in your municipality or are being implemented?*

Provision of areas, for example, for creating meadow orchards, urban wilderness, etc.	85 %
Renaturation of stream/river courses	56 %
Unsealing measures	28 %
Inclusion of retreat areas and food sources for animals in the planning and design of urban open spaces	26 %
Promotion of green roofs	23 %
Other, including wildflower meadows, tree planting, counteracting sealing	13 %

* Percentage higher than 100, as multiple responses were possible

M11 Is the "sponge city" principle applied in current designs or is its used planned?

	in total	Towns/cities	Rural municipalities
Yes	11 %	19 %	5 %
No	65 %	42 %	84 %
Currently being planned	24 %	39 %	11 %

M12 How do you evaluate the Baukultur value of buildings (architecturally or in urban planning terms) which have been created in your municipality in the named construction phases?

	High	Rather high	Rather low	Low	None exist
1918 and earlier	47 %	33 %	10 %	8 %	2 %
1919 to 1948	15 %	47 %	25 %	12 %	1 %
1949 to 1969	5 %	21 %	56 %	18 %	0 %
1970 to 1990	2 %	21 %	48 %	28 %	1 %
after 1990	5 %	26 %	39 %	29 %	1 %

M13 How high do you estimate the need for conversion and renewal in the building age classes described?

	High	Rather high	Rather low	Low	None exist
1918 and earlier	29 %	38 %	22 %	9 %	2 %
1919 to 1948	24 %	50 %	20 %	5 %	1 %
1949 to 1969	20 %	63 %	14 %	3 %	0 %
1970 to 1990	7 %	49 %	38 %	5 %	1 %
after 1990	1 %	6 %	50 %	42 %	1 %

M14 How often have buildings in the described building age classes been demolished in your municipality in the past five years?

	Very often	Often	Rarely	Never	None exist
1918 and earlier	2 %	8 %	62 %	26 %	2 %
1919 to 1948	2 %	13 %	70 %	14 %	1 %
1949 to 1969	2 %	23 %	62 %	13 %	0 %
1970 to 1990	0 %	12 %	58 %	30 %	0 %
after 1990	1 %	1 %	34 %	64 %	0 %

M15 Please estimate how often demolition applications are received or you are notified of a demolition for the following building types in your municipality.

	Very often	Often	Rarely	Never	None exist
Multifamily dwellings	0 %	3 %	52 %	44 %	1 %
Detached houses	1 %	17 %	69 %	13 %	0 %
Administration and office buildings	0 %	3 %	43 %	45 %	9 %
Commercial and trading properties	0 %	8 %	51 %	34 %	7 %
Warehouse and logistics buildings	0 %	5 %	44 %	38 %	13 %
Educational buildings	0 %	0 %	30 %	60 %	10 %
Cultural buildings	0 %	1 %	18 %	71 %	10 %

M16 Have municipal building stocks been demolished in favour of a replacement new building during the past ten years?

	in total	Towns/cities	Rural municipalities
Yes	43 %	54 %	34 %
No	57 %	46 %	66 %

M17 What is the ratio of the number of conversion projects for municipal buildings compared to new build projects during the past five years?

More conversion projects than new build projects	49 %
Equal numbers of conversion and new build projects	22 %
More new build projects than conversion projects	22 %
No projects implemented	7 %

M18 Do you check in advance whether a conversion is possible when developing municipal buildings?

	in total	Towns/cities	Rural municipalities
Yes, always	91 %	91 %	91 %
Yes, sometimes	8 %	8 %	8 %
No	1 %	1 %	1 %

M19 What are generally the decisive reasons for opting for demolition instead of conversion for municipal construction projects?*

Poor building fabric	82 %
Increased costs for conversion	82 %
Changing use standards	55 %
Better use of space through new build	35 %
Requirements of the German Building Energy Act	31 %
Building code requirements	29 %
Increased planning and design work for a conversion	22 %
Planning uncertainty of building in existing fabric	17 %
Design reasons	11 %
Other, including accessibility, contaminants	6 %

* Percentage higher than 100, as multiple responses were possible

M20 Has there been civic engagement in demolition/conversion projects in your municipality in the past ten years?

	in total	Towns/cities	Rural municipalities
No	54 %	39 %	66 %
Yes, demand for the retention of buildings threatened by demolition	28 %	42 %	16 %
Yes, demand for demolition and replacement new build of a building	15 %	15 %	14 %
Yes, demand for demolition of vacant, dilapidated buildings	14 %	17 %	12 %
Yes, miscellaneous, including discussions about demolition/new build	2 %	2 %	2 %

* Percentage higher than 100, as multiple responses were possible

M21 What is the situation regarding the railway station building(s) in your municipality?*

	in total	Towns/cities	Rural municipalities
There is no railway station building	40 %	12 %	62 %
Intact place of arrival in appearance and function	30 %	51 %	13 %
Change in use within the last ten years	22 %	30 %	17 %
Vacant	16 %	22 %	11 %
Dilapidated	8 %	12 %	5 %
Demolished in the past ten years	3 %	5 %	2 %
Reactivated as a railway station building within the past ten years	2 %	3 %	1 %

* Percentage higher than 100, as multiple responses were possible

M22 Who owns the railway station building (or the railway station building of the most important (main) railway station) in your municipality?

There is no railway station building	38 %
Deutsche Bahn (German national railway company)	25 %
Private owner	24 %
Municipality	13 %

M23 Are local development plans in your municipality mainly created for the unplanned outdoor area or are they also used in interior areas?

	in total	Towns/cities	Rural municipalities
Outdoors and indoors	63 %	61 %	65 %
Mainly in the indoor area	21 %	33 %	11 %
Only in the outdoor area	9 %	3 %	14 %
In the interior, mainly application of Sec. 34 BauGB	7 %	3 %	10 %

M24 What areas or offers for building or design advice exist in your municipality?*

Building advice and advice for developers/owners	60 %
Design bylaws	38 %
Design handbook / guide	23 %
Design advisory committee	15 %
Building preservation	4 %
Other, i.e. other advisory offers, various bylaws	13 %
N/A	17 %

* Percentage higher than 100, as multiple responses were possible

M25 Is protection of historical monuments integrated into existing building development tasks in your municipality?

	in total	Towns/cities	Rural municipalities
Yes, only if listed properties are concerned	67 %	64 %	69 %
Yes, including for non-listed properties	18 %	30 %	9 %
No	15 %	6 %	22 %

M26 How does your municipality deal with the term "building fabric particularly worth protecting"?*

The term "building fabric particularly worth protecting" has not been used to date in the municipality	52 %
Areas and/or buildings with building fabric particularly worth protecting have been defined	26 %
Designation is decided on a case-by-case basis on application	25 %
Uniform evaluation criteria exist, which are open to examination by the public	6 %

* Percentage higher than 100, as multiple responses were possible

M27 Are there funding programmes in your municipality for the conversion of existing buildings?

Yes	35 %
No	65 %

M28 To what extent are the following sustainability requirements integrated in calls for tender in your municipality?

	Very often	Often	Rarely	Never
Health and environmental compatibility requirements for construction materials	10 %	27 %	35 %	28 %
Requirements for the recyclability of construction products	4 %	19 %	42 %	35 %
Requirements for homogeneous separability of construction materials	7 %	18 %	38 %	37 %
Preparation of a life cycle cost analysis	1 %	10 %	31 %	58 %

Development of an energy and sustainability concept	8 %	28 %	31 %	33 %
Certification of sustainability	4 %	13 %	36 %	47 %

M29 Does your municipality plan to digitalise the municipal building stocks?

Yes, for all buildings	39 %
Yes, for selected buildings	27 %
No	34 %

M30 Have instruments for the quality assurance of construction projects been used in your municipality in the past five years?*

	in total	Towns/cities	Rural municipalities
No	44 %	22 %	63 %
Yes, open design competition	33 %	49 %	20 %
Yes, non-open design competition	23 %	39 %	11 %
Yes, multiple commissioning	22 %	43 %	6 %
Yes, cooperative procedure	11 %	22 %	2 %
Yes, dialogue-orientated workshop procedure	12 %	23 %	3 %
Yes, concept design awards for building plots with design requirements	25 %	43 %	10 %
Yes, other, including feasibility studies, design advisory committees	3 %	6 %	1 %

* Percentage higher than 100, as multiple responses were possible

M31 Re: question 30: If yes, were these instruments also used for the design of a conversion project?*

	in total	Towns/cities	Rural municipalities
No	35 %	36 %	33 %
Yes, open design competition	32 %	33 %	32 %
Yes, non-open design competition	22 %	22 %	21 %
Yes, multiple commissioning	18 %	25 %	8 %
Yes, cooperative procedure	6 %	7 %	3 %
Yes, dialogue-orientated workshop procedure	11 %	13 %	6 %
Yes, other, including feasibility studies, concept design awards	7 %	8 %	5 %

* Percentage higher than 100, as multiple responses were possible

M32 Which structure type would you assign to your municipality?

Large city	12 %
Medium-sized city	12 %
Small town	21 %
Rural municipality	55 %

M33 In which department do you work?

Urban planning	43 %
Urban development	37 %
Building code	33 %
Mayor	33 %
Building	23 %
Civil engineering	19 %
Traffic/transport	16 %
Green spaces	15 %
Economy	4 %
Order	3 %
Culture	1 %
Other, including building control office, protection of historic buildings and monuments	15 %

* Percentage higher than 100, as multiple responses were possible

M34 Are you aware of the Federal Foundation of Baukultur?

	in total	Towns/cities	Rural municipalities
Yes	52 %	84 %	25 %
No	48 %	16 %	75 %

The Federal Foundation of Baukultur, with the support of the Zentralverband des Deutschen Handwerk (German Confederation of Skilled Crafts), surveyed selected businesses in the main construction and finishing trades as well as commercial and industrial crafts and trades. The survey was conducted online from 13 January to 11 February 2022 and included the questionnaires completed by 90 trade and craft businesses in the analysis.

T1 In which trade do you classify your company?

Joiners	19 %
Bricklayers and concrete workers	18 %
Carpenters	10 %
Painters and decorators	9 %
Plasterers	7 %
Electricians	4 %
Installers and heating contractors	4 %
Metalworkers	4 %
Stonemasons and stone carvers	4 %
Roofers	2 %
Tile, slab and mosaic layers	2 %
Floorers	1 %
Timber and building protection trade (masonry protection and timber impregnation in buildings)	1 %
Road builders	1 %
Other, including restorers	14 %

T2 In which employee size class do you classify your company?

1	16 %
2 to 4	27 %
5 to 9	27 %
10 to 19	10 %
20 to 49	9 %
50 or more	11 %

T3 In which turnover size class do you classify your company?

up to €22,000 p.a.	2 %
€22,000 to €50,000 p.a.	7 %
€50,000 to €125,000 p.a.	17 %
€125,000 to €250,000 p.a.	10 %
€250,000 to €500,000 p.a.	22 %
€500,000 to €5 million p.a.	31 %
€5 million p.a. and more	11 %

T4 Preferred area of work

T4a On which type of construction site do you prefer to work: New build or conversion or renovation?

Conversion/renovation	78 %
New build	22 %

T4b Why do you prefer to work on a new build or a conversion or renovation project?

The surveyed businesses had the opportunity to give reasons for their selection in an open question. In conversion and renovation projects, it is mainly the orientation of their own company, the relevant technical qualification, their own interests as well as sustainability and economic aspects that play a role. For new build projects, the companies mention reasons such as greater planning reliability and easier implementation as well as the orientation of their own business and employees.

T5 What percentage of your turnover is achieved in the named areas?*

Conversion/renovation	71 %
New build	29 %

* Average values

T6 Please assess: Which area will be more important for your company in the next ten years?

Conversion/renovation	85 %
New build	15 %

T7 How important is it for you that, with your work, you contribute to a well-designed and valuable building/structure in Baukultur terms?

Very important	65 %
Important	24 %
Less important	9 %
Not at all important	2 %

T8 How often are you involved in design decisions on the construction site or in advance?

	Very often	Often	Rarely	Never
In conversion/renovation	41 %	45 %	13 %	1 %
In new build	17 %	19 %	45 %	19 %

T9 Would you like to be involved more frequently in questions regarding design and material selection?

Yes	78 %
No	22 %

T10 As a matter of principle, what do you think of using construction materials homogeneously, and ensuring subsequent separability – for example, to make conversions or demolition work easier or to enable the reuse of building elements?

Makes good sense	94 %
Does not make sense	6 %

T 11 Cooperation between designers and contractors**T 11a** How do you evaluate the cooperation between architects and other designers and contractors on the construction site?

Very good	5 %
Good	60 %
Less good	27 %
Not good	7 %
No experience with this cooperation	1 %

T 11b If you wish, you can describe your own experiences here.

The surveyed skilled trades companies were also able to describe their own experiences: Positive aspects of cooperation between designers and contractors on the construction site relate in particular to constructive exchange and a feel for the project and the others involved by the designers. According to the companies, negative experiences are mainly caused by the lack of knowledge on the part of the designers or due to a poor grasp of the context and the other persons involved.

T 12 In your view, which topics will be particularly relevant for the construction sector in the next ten years?*

Sustainable construction materials and methods	84 %
Return to manual skills	69 %
Regional and renewable construction materials	58 %
Climate-compatible construction methods and processes	55 %
Recyclable building	42 %
Return to simpler construction methods and less technology	41 %
Homogeneous building	39 %
Technical innovations for energy efficiency	35 %
Digitalisation of construction processes	33 %
Development of completely new building techniques and products	16 %
Use of robotics on the construction site	6 %
Other, including the availability of skilled personnel	10 %

* Percentage higher than 100, as multiple responses were possible

T 13 Which location would you prefer for your company – if you had a free choice and independent of your current location?

Location on the edge of the city or town	55 %
Location in an integrated, urban business park	23 %
Central location in the town centre / in the inner city	12 %
Other, i.e. ... (name other locations)	10 %

T 14 From your point of view, should the topics of retention and conversion of buildings and good design be part of industry-wide training?

Yes	91 %
No	9 %

T 15 Would you like to inform us about anything else, for example, on the topics of BIM, approval and planning procedures, the procurement of construction materials, ...?

In this open question, the surveyed businesses had the opportunity to comment on other topics. Above all, the challenges caused by the bureaucratic and regulatory frameworks were named, but the shortage of young recruits, the vocational training requirements and the challenges due to digitalisation were also discussed here

The Federal Foundation of Baukultur, with the support of the Bundesarchitekten- und Bundesingenieurkammer (Federal Chambers of Architects and Engineers) surveyed employees in planning and design professions. The survey was conducted online from 3 to 25 February 2022 and included the questionnaires completed by 1,037 participants in the analysis.

PD1 In which area do you mainly work?

Building architecture	45 %
Urban planning	19 %
Structural engineering (buildings)	12 %
Landscape architecture	5 %
Interior design	4 %
Structural engineering (bridges, infrastructure)	2 %
Civil engineering	2 %
Other, including urban development, protection of historic buildings and monuments, project development, public administration, research and teaching	11 %

PD2 What is the focus of your professional work?

New build	28 %
Conversion	26 %
Renovation	24 %
Other, including several of the mentioned areas, urban development, protection of historic buildings and monuments, project development, public administration, research and teaching, conveying Baukultur,	22 %

PD3 In the professional debate, with regard to climate protection and resource conservation, some are calling for new build projects to only be approved as the “ultima ratio” in future. Instead, building should primarily take place in existing buildings. How do you evaluate this proposed requirement?

Is right	34 %
Is partly right	55 %
Is wrong	9 %
I don't know	2 %

PD4 If you answered “right” / “partly right”: To what extent are you already able to implement this standard in your professional practice?

Always	7 %
Often	49 %
Rarely	40 %
Never	4 %

PD5 From your point of view, what are the decisive reasons that often hinder the retention of existing buildings?*

Too much structural work needed to adapt to changing use standards	46 %
Wishes of the owner/developer or requirements from the tender specification/competition	42 %
Risks too large due to unforeseen circumstances	42 %
Poor building fabric	41 %
Better use of property space through new build	38 %
Fire protection requirements	33 %
Higher costs in the construction phase	33 %
Requirements of the German Building Energy Act	27 %
Building code requirements	21 %
Better technical knowledge of all participants in new build	19 %
Poorer cost efficiency in the use phase	18 %
Sound insulation requirements	17 %
Design reasons	9 %
Time pressure	8 %
Other, including lack of flexibility, lack of consultation, lack of appreciation	12 %

* Percentage higher than 100, as multiple responses were possible

PD6 Have you ever recommended retention and conversion instead of demolition on your own initiative and contrary to your brief?

Yes	77 %
No	23 %

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on page 52 also shows the Spreestudios and
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The Baukultur Report 2022/23 is the fifth report on the state of Baukultur in Germany under the leadership of the Bundesstiftung Baukultur (Federal Foundation of Baukultur). In addition to a population survey and a municipal survey, surveys of skilled trade businesses and employees in planning and design professions were also conducted. Particularly important survey results are additionally highlighted next to the main text.

Apart from the survey results, the appendix also contains additional project descriptions and image credits for the projects presented in the main part of the publication. The numerous sources and publications used to produce the report are also included in the appendix.

In the report, the third person plural form is used for better readability. This form is also explicitly nonbinary and gender-neutral and always refers to all gender identities.

Names and titles of institutions, research programmes, ministries, etc. are written in full the first time they are mentioned, directly followed in English and the German abbreviated form in brackets. The abbreviations are then also used in the text.

The future of building lies in a new Baukultur of Conversion. In view of social challenges such as climate change, scarcity of resources and the energy crisis, the cycle of perpetual demolition and new build must be broken. Appreciation of the Baukultur accomplishments of periods gone by as well as awareness of the identity-establishing character of existing structures and evolved living spaces speak in favour of retaining the existing building stock and structures. A new Baukultur of Conversion adapts buildings and structures to changing functional and aesthetic standards. At the same time, a new, contemporary design language is arising from the examination of what exists, which at best already anticipates future conversions.

The three focus topics of the Baukultur Report 2022/23, “Conversion of City and Land”, “Buildings and Infrastructures” and “Conversion – Rethinking”, deal with a new Baukultur of Conversion on the different levels of scale. The range extends from sustained conversion of our cities and issues relating to dealing with the existing building stock through to the necessary adaptation of construction methods and processes suitable for the future. Legal, economic, technological as well as social requirements are placed in relation to urgent fields of action. It is a matter of a new self-image of the building professionals, changing underlying conditions and a different view of building. We are at the beginning of a profound change in Baukultur.