COUNTRY FACT SHEET

OVERVIEW OF SUSTAINABLE REAL ESTATE IN GERMANY

DECEMBER 2021

KEY WORDS: GERMANY, EPC, ENERGY ACT, CLIMATE ACTION PLAN, WATER STRATEGY, BIODIVERSITY, CARBON

KEY FACTS

7.4%

Rate of land artificialisation in Germany (2018) / 4.2% for EU countries

35%

Part of German final energy consumption due to the building sector (2021) / 40% for France

LEGISLATION IN GERMANY

The legislative organisation in Germany differs from the French administration because Germany is a federal country with 16 Länder, represented at the federal level by the Bundesrat. The Bundestag is the parliamentary assembly which passes the laws. There are different departments forming the German federal government (the Bundesregierung) and called Bundesminister. One bill has to be approved by the Bundestag and the Bundesrat, and then published in the Federal Law Gazette, after approval of the Federal Chancellor, the Federal President and the ministers involved. After this process, the act is promulgated. If no specific date is mentioned in the act for its application, it automatically becomes effective as of the 14th day following its publication in the Federal Law Gazette. In Germany, a federal act or law is called a Bundesgesetz.

	Building Energy Act (GEG)	Energy Efficiency Strategy for Buildings
	Building Electric Mobility Infrastructure Act (GEIG)	
	Climate Action Plan 2050	
	Fuel Emissions Trading Act (BEHG)	
	German Sustainibility Strategy	
	National Strategy on Biodiversity	
	Nature Conservation Act	
	National Water Strategy	
	Maps of natural hazards	
	Model Building Regulation	Chemicals Prohibition Ordinance
	Soil Protection Act & Ordinance	Circular Economy Act
	German Civil Code	
	Measuring Point Operation Act	

Table.1: National and European strategies, legal texts and resources about the building sector in Germany. Source: OID, 2021.

Key: Legal texts (act, ordinance, regulation), Non-legal texts (strategy, plan), *Resources*

Energy

In 2013, the German building stock combined 19 million residential buildings, and 3 million non-residential buildings. According to the IEA, in 2018, 33% of total primary energy supply (TPES) in Germany came from oil, 24% from natural gas, 23% from coal, and low-carbon energy sources represented only 22% (including nuclear for 13%) of the total amount. TPES comprises production + imports - exports. This equals the total energy that is consumed domestically, either in transformation or in final use.

The latest studies have confirmed that the building sector is the first sector in terms of energy consumption, with 35% of the country's total consumption. Today, the EnEV 2014-2016 regulation sets the maximal energy consumption at 56 kWh_{pe}/sqm per year. Since 2009, new buildings must be equipped with installations to produce renewable energy, except if the energetic performances of the building are already set at a very high standard.

In Germany, the primary energy conversion factor for electricity has been reduced from 2.6 to 1.8 in 2020, due to the planned increase in the share of renewable energy (OFATE, 2017). This means that for 1 kWh_{fe}, 2.6 kWh_{pe} are needed. On the other hand, the carbon intensity of electricity in Germany is 0.461 $kgCO_2e$/kWh. (ADEME, 2011)

35 %

Energetic consumption of the building sector in Germany

1.8 x

Primary energy conversion factor

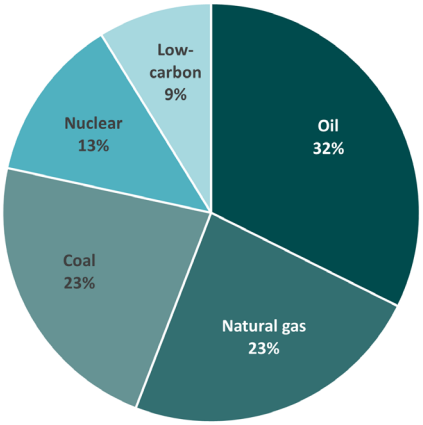

Fig.1: Total Primary Energy Supply in Germany in 2018. Source : IEA, 2020.

BUILDING ENERGY ACT (GEG)

This act combines laws concerning energy and heating for residential and non-residential buildings. It provides information on the required energy for conditioning the building (i.e. heating, cooling, ventilation and hot water; additionally lighting in non-residential buildings) and does not include user energy.

The KfW (the Kreditanstalt für Wiederaufbau, i.e. Reconstruction Loan Corporation) financing promotes construction of buildings compliant with environmental requirements. The better the energy efficiency of the constructed building, the higher the financing. Significant funding can be expected if the requirements of the Energy Building Act (GEG) are exceeded.

The KfW also finances renovation of buildings, provided that certain requirements are met. For example, there are KfW Efficiency House 55, 40 or 40 Plus standards. A KfW Efficiency House 55 has a primary energy requirement that is 45% lower than the reference building of the Building Energy Act. The KfW Efficiency House 40 uses even less energy.

FOR NEW CONSTRUCTION

No fixed target values for energy demand (i.e. the estimated consumption of the building), but use of a reference building method, referring to primary energy. This method refers to a reference building with the same geometry and usage as the building under consideration.

Energy loss must be limited by a good thermal insulation.

Energy demand must be partially covered (15%) by renewable energies. It is possible to deduct renewable energy when determining annual primary energy demand, if the energy is generated near the building and primarily used in the building itself and only the energy surplus fed into the public grid.

FOR THERMIC RENOVATION

During the thermal renovation of a building, there is a need to comply with requirements, concerning maximum values for heat transmission coefficients of external components (Appendix 7 of the GEG). Modifications to external components that do not affect more than 10% of the total area of the respective component group of the building are excluded. In case of a global renovation, a complete energy assessment must be done.

FOR OTHER RENOVATIONS

When renovating a building, no deterioration of the energetic performance of a building is allowed. This means that the external elements of a building must not be modified in such a way that it alters the energy quality of the existing building. A certain refurbishment can be necessary and needs to be applied for expansion or extension.

ENERGY PERFORMANCE CERTIFICATE (EPC)

Provided for new, changed, sold or re-let buildings. 2 types of EPCs:

ENERGY DEMAND CERTIFICATE

Calculated needs of the building. Only mandatory if the building was newly constructed, changed or if a residential building with less than 5 living units doesn't comply with the Ordinance of Thermal Insulation from 1977.

ENERGY CONSUMPTION CERTIFICATE

Existing consumption data for at least the last 3 years.

ENERGY EFFICIENCY STRATEGY FOR BUILDINGS

Primary energy demand, efficiency pathway and renewable energy pathway. In 2050: the entire residential building stock will need on average only just less than 40 kWh_{pe}/sqm per year. For non-residential buildings the target value is approximately 52 kWh_{pe}/sqm per year.

In 2008, the average energy consumption in residential buildings was 227 kWh_{pe}/sqm per year and 265 kWh_{pe}/sqm per year for non-residential buildings (OFATE, 2017).

This strategy is part of the National Action Plan on Energy Efficiency (NAPE), adopted in 2014 by the Federal Government.

BUILDING ELECTRIC MOBILITY INFRASTRUCTURE

- New residential buildings with more than 5 parking spaces:

Every parking space needs to be equipped with infrastructure for e-mobility.

- New non-residential buildings with more than 6 parking spaces:

Every third parking space needs to be equipped with at least one charging point.

- For major renovation (more than 35% of the surface) with more than 10 parking spaces:

Residential buildings, and at least every fifth parking space in non-residential buildings, must also provide at least one charging point.

- In non-residential existing buildings with more than 20 parking spaces:

The installation of at least 1 charging point for electric vehicles by 2025 is needed.

MASTER PLAN CHARGING INFRASTRUCTURE

Support programs for e-mobility (i.e. electric vehicles).

Electric Mobility Act (objective of 50 000 charging points by 2022). In August 2021, Germany had 46 000 charging points.

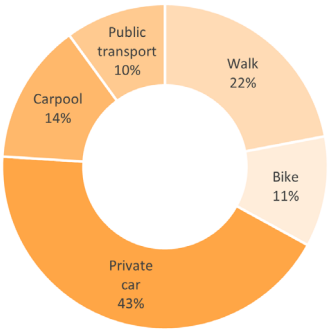

Fig. 2: Share of means of transport in Germany in 2017. Source: German Ministry of Transport.

SUSTAINABLE BUILDINGS CERTIFICATIONS IN GERMANY

In Germany, the DGNB (German Sustainable Building Council) has its own certification system, which is recognised worldwide and sets requirements regarding energy consumption, impacts on the environment, use of resources and life cycle assessment. It is the most delivered certification in Germany, with 1200 DGNB certifications in the country (GreenSoluce, 2021), spread across several cities.

Local variations of the major global certifications also exist in the country. There is a version of the BREEAM certification in Germany, the BREEAM DE. Also, the US Green Building Council certification LEED is valid in Germany, as well as the HQE label from Certivéa in France. On the other hand, a Passivhaus label exists in Germany, which promotes the construction of buildings with very low consumption related to heating and cooling (less than 15 kWh/sqm, in useful energy, per year).

Greenhouse gases

0.367

$kgCO_2e/kWh$
Carbon intensity of electricity

As the first sector in terms of energy consumption, buildings represent 33% of CO_2 emissions in Germany. The Climate Action Plan 2050, adopted in 2016 by the German Cabinet (Bundesregierung), provides guidelines to be followed by all sectors to reach carbon neutrality by 2050.

This follows the climate goals of the Paris Agreement. Furthermore, Germany considers the European Trading Scheme (the European carbon market with emissions quotas) as a major tool to decrease greenhouse gases emissions.

Since 2010, the country has set ambitious goals in terms of emissions reduction, with 80 to 95% GHG emissions reduction target by 2050. The Climate Action Plan 2050 therefore follows and completes this previous strategy.

There is also a German Advisory Council on Global Change (WBGU, the Wissenschatflicher Beirat der Bundesregierung Globale Umweltverändungen) that provides guidance for political decision makers.

CLIMATE ACTION PLAN 2050

A decrease in global emissions is scheduled:

- 2030: - 55%
- 2040: -70%
- 2050: largely greenhouse gas neutral.

The reference year is set up in 1990.

Target for the building sector:

- 2030: - 67%
- 2050: nearly climate neutral building stock

The reference year is also set up in 1990.

Measures: changed standards for new buildings, strategies for refurbishing the building stock, gradual phase-out of fossil-fuel heating.

FUEL EMISSIONS TRADING ACT (BEHG)

Introduced in 2021, the national Emissions Trading Scheme (nEHS) in Germany follows the Fuel Emissions Trading Act (BEHG for Brennstoffemissionshandelsgesetz) that was introduced in 2019. Ath the time, prices were set until 2025 to regulate the increase in the price of carbon, and thus discourage different sectors from continuing to emit CO_2.

FUEL EMISSIONS TRADING ACT

The national Emissions Trading Scheme (nEHS for nationales Emissionshandelssystem) was introduced in 2021 because the emissions of heating buildings and transport were not covered in the European Emissions Trading System (i.e the European carbon market). Energy sources like coal, oil or gas are addressed in the nEHS of the heating sector.

Price per ton of CO_2 is €25 as of January 2021. Then, the nEHS plans an annual rise of the price until €55/ton of CO_2 in 2025. In 2026, the trading system will start auctioning certificates between a minimum of €55/ton of CO_2 and a maximum of €65/ton of CO_2. Total quantity of certificates is limited according to the climate targets. CO_2 compensation is not included in legislation.

CARBON PRICE HITS RECORD IN 2021

2021 saw a historic increase in energy prices. On the European Emissions Trading System, the price per ton of CO_2 reached €55, set by the nEHS for 2025, in May 2021, and then a historic maximum of €65 in October 2021. This is an unprecedented situation that was not anticipated in the regulations.

HFC'S EMISSIONS REDUCTION

The EU-regulation on 517/2014 on fluorinated greenhouse gases offers several measures:

- Introduction of a gradual phase-down of quantities of hydrofluorocarbons (HFCs) available on the market to one-fifth of current levels by 2030
- Prohibitions on use and placement of fluorinated gases on the market, so far as technically feasible and more climate friendly alternatives are available
- Continuation and expansion of the scope of regulations concerning leak tests, certification, disposal and labelling

Biodiversity

GERMAN SUSTAINABILITY STRATEGY

According to the European study Lucas about land use, the rate of land artificialization in Germany is 7.4%. The average value in Europe is 4.2%.

The goal is to limit the use of additional land for settlement and transport purposes to an average of less than 30 hectares per day by 2030.

NATURE CONSERVATION ACT

Legislation on biodiversity areas and regulations on invasive plants and animals. This legislation contains an article concerning the relationship to the building law.

It is linked to the Federal Building Code, and states that the interventions in nature are anticipated as a result of interaction (modification, suspension, ...) with local land-use plans and that decisions regarding avoidance or compensation must be taken according to the Federal Building Code.

NATIONAL STRATEGY ON BIODIVERSITY

National orientation for biodiversity.

Overview on biodiversity measures available by the German Environment Agency.

Physical risks & Water

Physical risks in Germany: storms, earthquakes, avalanches, floods, heavy rain, hail, landslides, storm surges, extreme climate and wildfires.

Flood hazard map in each German state.

Maps on air quality and tool on noise emissions are provided by German Environment Agency (UBA).

Maps on water stress conditions and drought risk.

NATIONAL WATER STRATEGY

This strategy was presented in 2021.

Objectives:

- ensure water resource security in case of droughts
- set up polluted water management
- support water reuse
- manage water footprint

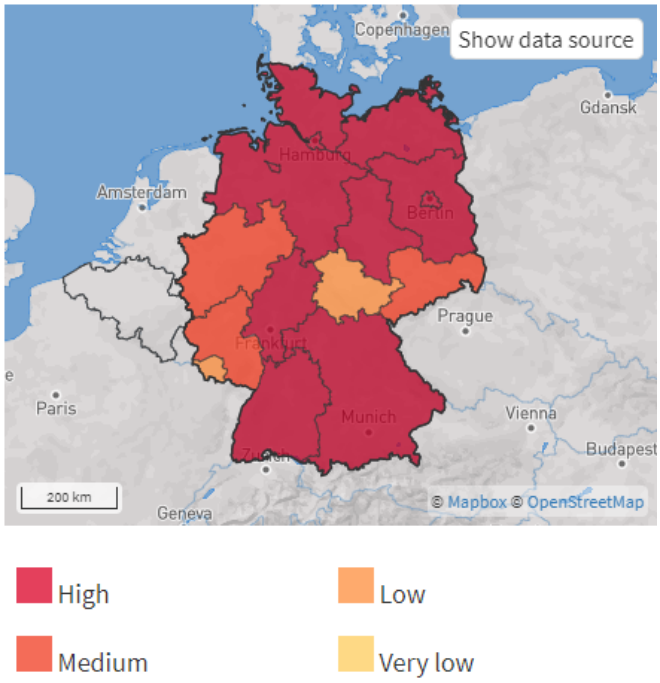

Fig.3: Flood hazard map. Source: thinkhazard.org.

SEVERE FLOODS IN 2021

In July 2021, major floods due to heavy rainfalls affected Germany, causing the death of at least 190 people and the destruction of numerous infrastructures and buildings. The government had to earmark a 30 billion euro financial support to restore the impacted areas and buildings. This came after a first emergency aid of 200 million euros following the disaster. These dramatic events emphasize the importance of taking physical risks into consideration, and of adapting buildings to natural and climate-related hazards, to protect both residents and infrastructures.

Fig.4: Floods in Germany, 2021. Source: letelegramme.fr

Pollution & Waste

EU POLLUTION REGULATIONS

Overview on SVHC (Substance of Very High Concern) provided by the Environment Agency. Regulations on SVHC can be found in REACH (Registration, Evaluation, Authorisation and restriction of Chemicals).

No limiting values – only guidelines regarding VOC (Volatile Organic Compounds) in indoor air.

Furthermore, the EU Taxonomy, setting out a list of conditions for environmentally sustainable economic activities, establishes 6 environmental objectives, including "pollution prevention and control".

MODEL BUILDING REGULATION

Description of requirements for building products, defined in cooperation with the German Institute for Structural Engineering (DIBt).

Requirements and NIK-values (NIK = lowest concentration of interest, i.e. the lowest concentration for which there is a health risk) described in the Assessment Scheme by the Committee for the Health Evaluation of Building Products.

List with guide values for substances that are particularly important for a healthy environment provided by the Committee for Indoor Guideline Values:

- Guide value 1 is precautionary. It describes the concentration of a substance in indoor air at which no health impairment is to be expected, even with lifelong exposition. Orientation values for new construction.
- Guide value 2 describes the concentration of a substance at or above which immediate action must be taken, because the concentration can be a health hazard.

Formaldehyde (carcinogenic): recommendation by the UBA (German Environment Agency) for a guide value of 100 µg/m3. Formaldehyde forbidden in connection with some wood products, as stated in the Chemicals Prohibition Ordinance.

SOIL PROTECTION ACT AND ORDINANCE

Negative effects on soils must be avoided, and such negative effects on soils must be rehabilitated if impossible to avoid. Precisions on standards for the evaluation of contaminated sites and decision-making process.

CIRCULAR ECONOMY ACT

70% (in weight) of non-hazardous construction and demolition waste (except for soil and stones without hazardous substances) to be recycled or prepared for re-use, since January 1st, 2020.

Producers and holders of construction and demolition waste shall collect and transport the waste fractions listed in Commercial Waste Ordinance and prepare the waste for re-use or recycling.

In general terms, the law in Germany promotes recycling of all waste, with goals of recycling waste set by the Verpackungsgestetz (a law mainly about packaging). Also, the Umweltgesetzbuch (the environmental code) states that the legal obligation of recycling falls upon both the producer and the holder of the waste.

Tenancy regulations

The Central Real Estate Committee (Zentraler Immobilien Ausschuss, ZIA) published in 2018 a compilation of sustainable clauses related to lease agreements. There is, however, no standard or common definition of a "green lease" in Europe.

GERMAN CIVIL CODE (BGB)

Distinction between conservation and modernisation measures. The costs of conservation are at the owner's expense.

Modernisation measures have to be announced at the latest 3 months before execution. Only modernisation costs can be passed on to the tenant: up to a maximum of 8 % of the annual total cost and the monthly rent may only increase by a maximum of 3 euros per sqm, within 6 years due to modernisation.

ACT ON METERING POINT OPERATION

The Measuring Point Operation Act was introduced in 2016, following the law on the digitisation of the energy transition.

This act regulates the installation of smart meters to measure energy consumption. It states that smart meter data transmission is only permitted for the applications required for energy industry operations.

All consumers can access their consumption data at all times and they must agree to any additional data traffic. An access to the data stored in the electronic storage of the meter must be guaranteed to the user by the operator.

SUSTAINABLE REAL ESTATE IN GERMANY

The DGNB (German Sustainable Building Council) is a non-profit organisation that covers different topics with its expert and strategy groups to support the development of sustainable buildings. The GdW (Wohnungswirtschaft Deutschland) is an association for real estate and residential buildings bringing together many real estate companies. Concerning energy performances, the French-German office for energy transition leads a network of different political and industrial actors to help and organize a sustainable energy transition in different sectors, including real estate.

RESOURCES

- Building Energy Act
- Energy Efficiency Strategy
- Building Electric Mobility Infrastructure Act
- Master Plan Charging Infrastructure
- Electric Mobility Act
- Climate Action Plan 2050
- National Emissions Trading
- National Water Strategy
- German Civil Code
- Operating Costs Ordinance
- Model Building Regulation
- Indoor Guidelines Values
- Chemicals Prohibition Ordinance
- Soil Protection Act
- Contaminated Sites Ordinance
- Circular Economy Act
- Commercial Waste Ordinance
- National Strategy on Biodiversity
- German Sustainability Strategy
- Nature Conservation Act
- German Advisory Council on Global Change
- German national Emissions Trading Scheme

PICTOGRAM KEY

Energy | *CO_2 Emissions* | *Biodiversity* | *Physical risks* | *Water* | *Waste* | *Tenancy Regulations*

ABOUT US

OID (Green Building Observatory) is an independant space for discussions between actors of the real estate industry, on sustainable development. Our purpose is to imagine responsible real estate. OID has more than 80 members and partners, among them the leaders of commercial real estate in France over the whole value chain. OID is an association contributing to the rise of ESG topics in France and abroad, through an action programme in the field and towards the public sector. The European Sustainable Real Estate Initiative (ESREI) is a programme launched by OID to extend its work to study European countries and help real estate professionals abroad.

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