

## **Empira Study: Massive New Housing Construction Required to Meet Climate Targets**

- **Energy consumption by private residences only down 2.6% overall since 1990 – much slower decline than industrial (–14.9%) or commercial (–22.6%) sectors**
- **Regional differences: Energy consumption in Brandenburg (35 GJ/inhabitant) nearly twice as high as in Berlin (20 GJ/inhabitant)**
- **Ageing housing stock: Only 13.8% of housing stock new or fully renovated**
- **New construction uses 41% less energy than unrenovated housing units; fully renovated units use 24% less**

**Zug, Switzerland; August 13, 2021** – In its latest research study, the Empira Group, a leading manager of institutional real estate investments, compared the energy footprint of new and existing residential buildings in Germany and Europe. The core finding of the analysis is that national and European climate targets can only be met if significantly more new housing is built by the private sector. Germany's housing stock in particular is much older than the EU average, and only 13.8% of the country's residential buildings are new or completely renovated. In addition to the age and quality of the structures themselves, the study also considers factors such as the building type (single-family, two-family, and multi-family homes), new construction activity, climate, and the use of space in terms of their impact on energy demand.

"New residential construction has substantially greater potential for conserving energy and cutting emissions than renovating existing buildings. However, Germany continues to trail its ambitions – including compared to other European countries. For Germany to catch up, the considerable potential especially of larger professional real estate companies equipped with extensive private capital must be tapped. These will continue to play by far the most important role in residential construction in Germany in the future," says Prof. Steffen Metzner, Head of Research at Empira and author of the study.

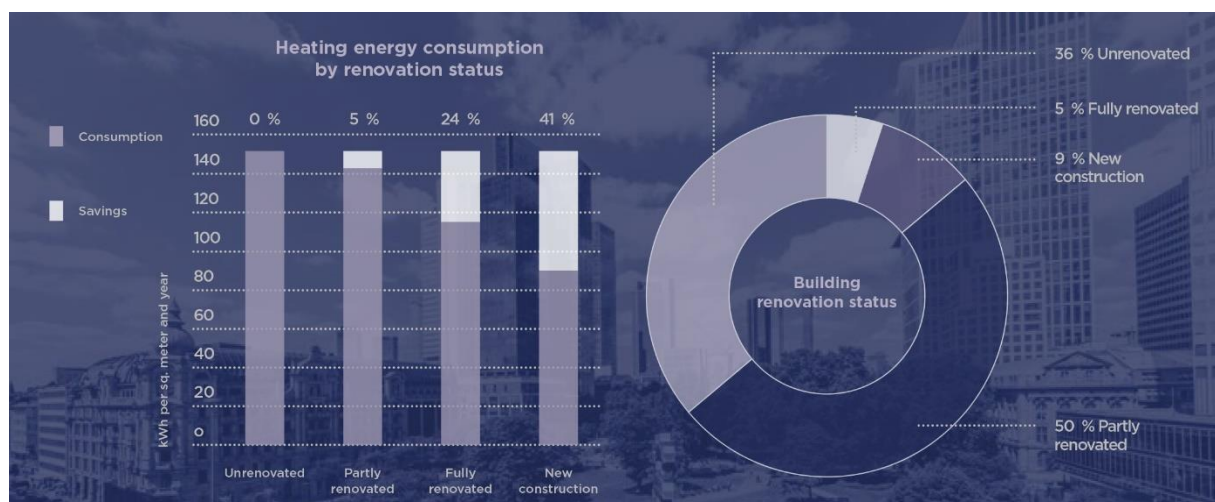
### **Energy consumption in the residential segment hardly declining – per capita living space increasing sharply**

The private residential segment is a relative outlier in the context of technology-driven energy efficiency improvements and significantly stepped up political and societal efforts to reduce energy consumption and the associated carbon emissions. Whereas energy consumption in the German industrial and commercial sectors has declined by 14.9% and 22.6%, respectively, since 1990, consumption by private dwellings dropped by just 2.6%. This discrepancy is

explained by the absolute increase in available living space and especially much larger living space per capita. The latter grew around 34% from 35 m<sup>2</sup> in 1990 to 47 m<sup>2</sup> in 2019.

### Housing stock in Germany is considerably older than the EU average

One key criterion for improving the energy footprint of Germany’s housing stock is the building fabric. Older unrenovated buildings in Germany consume an average of 151 kWh per m<sup>2</sup> and year in heating energy for space heating and hot water. This segment alone makes up 36% of Germany’s residential housing stock. At 143 kWh/m<sup>2</sup>, partially renovated buildings (defined as buildings where at least one and no more than three energy-efficiency projects have been completed) make up 50% of the housing stock but used only 5% less energy. Fully renovated residential buildings reduce heating energy consumption to 115 kWh/m<sup>2</sup>, for savings of 24%. The most significant efficiency improvement was exhibited by new buildings constructed according to current technical standards. These include buildings constructed in 2002 or later with average heating energy consumption of 89 kWh/m<sup>2</sup>, or only 59% of that used by an unrenovated reference property. Thus, fully renovated and newly constructed residential buildings only amount to 13.8% of the housing stock in Germany.



**Fig.: Building renovation status and heating energy consumption by renovation status in Germany (1995 to 2019); source: co2online, Empira calculation and illustration**

Comparing housing across Europe reveals not less than four distinct age categories for buildings, each with major similarities in the applicable energy efficiency standards: buildings constructed up to 1945, between 1945–1979, between 1980–1999, and in 2000 or later. In Germany, the share of older buildings constructed up to 1945 is 25%, close to the EU average of 23%. However, a much greater share of the country’s housing stock (49% compared to the EU average of 42%) was built between 1945–1979. In contrast, newer and generally much

more energy-efficient residential buildings constructed from 1980–1999 are underrepresented (19% compared to the EU average of 22%) as are especially those built after 2000 (7% compared to the EU average of 13%). The share of residential buildings constructed in 1980 or later reaches 46% in countries like Finland, compared to 26% in Germany.

“The numbers are crystal clear. Germany and Europe urgently need to build more new housing more quickly, particularly in the major cities and their immediate vicinity. The public sector must pick up the pace in designating more land for construction,” says Lahcen Knapp, Chairman of the Board of Directors of Empira AG. “Institutional investors increasingly value the positive climate and energy footprint of residential development projects explicitly in addition to their attractive risk-return profile,” adds Knapp.

### **Stark regional differences in energy consumption and building fabric**

Naturally, new construction and renovations are key factors in updating Germany’s housing stock. Housing is being constructed primarily in the in-demand major cities. In Frankfurt/Main, around 8% of the housing stock was newly built in the period from 2011 to 2019 alone. Munich’s rate is equally high at almost 8%, while Hamburg added more than 6% to its housing stock. Cologne, Stuttgart, Berlin, and Düsseldorf each have new construction rates of between 4% and 5%. This also indicates the great significance of major cities for providing housing, improving quality, and ensuring sustainability of the housing stock.

In a European comparison, Germany builds relatively little new housing (3.47 dwelling units/1,000 inhabitants in 2018). For instance, in relation to the population, Austria built much more housing than Germany (6.48 units per 1,000 inhabitants) in the past few years. Belgium, France, and Poland also build more housing units, while the Netherlands are comparable to Germany in construction activity. On the other hand, the Czech Republic and Italy (1.35 units/1,000 inhabitants) trail the other EU countries.

### **Multi-family buildings much more energy efficient**

The sometimes enormous differences in average energy consumption in the private residential segment in various German states are primarily attributable to building types’ differences. The significant divergence in the share of one-, two-, and multi-family buildings respectively explains Brandenburg’s energy consumption of 35 gigajoules (GJ) per inhabitant, which is nearly double that of Berlin (20 GJ/inhabitant). Multi-family properties use 9.6% less heating energy and 42.0% less electricity than one- and two-family buildings. Just



slightly over 40% of the housing stock in Berlin consists of one- and two-family buildings, whereas this category makes up more than 80% of the housing stock in Brandenburg.

The full study can be downloaded [here](#).

### **About the Empira Group**

With assets under management of approx. 4.2 billion euros, the Empira Group is one of the leading investment managers for institutional real estate investments in the German-speaking regions of Europe. The company specialises in the development of innovative and high-yield investment approaches, offering institutional investors in-house solutions in areas such as project development and land banking. In the field of real estate debt funds the company is one of the market leaders in German-speaking Europe, offering both mezzanine and whole loan products.

The real estate and capital market experts at the Empira Group cover the entire value creation process: from the identification of first-class investment opportunities with all property types, through ensuring a smooth acquisition process, to experienced asset management. The clients are institutional investors from Germany, Austria and Switzerland. The company has its headquarters in Zug (CH) with additional offices in Luxembourg, Frankfurt, Berlin, Munich and Leipzig.

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