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Techem Consumption
Figures Study 2022

Key points at a glance

The growing Greater awareness of sustainability and, above all, the rising costs e in of electricity and gas prices are shifting taking the energy debate from the political stage arena to German households.

Sustainable energy is not only an issue just a concern for the the industry , but also its responsibility: how can we save energy, ensure make its affordable affordability, and – above all – most importantly, continue to make it available accessible tofor everyone in our country – regardless of whether they live in an apartment building, a detached or semi-detached house, rented or , owned, or live in an old or a new building?

Our **Techem Consumption Figures Study 2022** is a vital resource contributes to for this stocktakingassessment. It shows where we stand, where we need to go, and what we can realistically achieve. It is based on the evaluation and analysis of data on consumption and costs for heating and hot water consumption and costs from 1.4 million German homes across in approximately around 120,000 apartment build- ings in 2022.



Development of energy sources

Natural gas remains the dominant energy source for heating, covering over half of the heated areas in multi-family housing units. This figure has remained stable for years, with only minor fluctuations of 2–3 percent. As in previous years, the use of heating oil has continued to decline and now accounts for less than 10 percent of energy sources. Meanwhile, wood and electricity are steadily gaining popularity as energy sources for both room heating and domestic hot water. The same is true for the adoption of heat pumps in new constructions: their share in new buildings jumped by 6 percentage points to reach 57 percent in 2022. In detached and semi-detached houses, this figure was as high as 61 percent, compared to 36 percent in multi-family buildings. These figures are expected to rise even further in the coming years.

Great potential for monitoring and optimizing heat-pump operation

The increasing adoption of heat pumps for supplying heat to multi-family buildings requires a closer evaluation of their efficiency. The data from the 2022 observation period indicates that while heat pumps achieve respectable efficiency levels, they generally fall short of reaching their optimal operational state. This underscores the need for improvements in heat pump monitoring and operational management. Our evaluations show an average optimization potential of around 25 percent and significantly more for a third of the systems. This is particularly important because the cost-effectiveness of transitioning from natural gas boilers to heat pump systems relies on their optimal use. The cost of electricity also significantly impacts the economic operation of these systems.

Around half the heating systems in German residential buildings currently heated with radiators are already suitable for heat pump technology. With an upgrade in radiators, this figure rises to as much as 90 percent. For the efficient operation of heat pumps, the radiators must be large enough to enable operation at the lowest possible system temperatures. An analysis of data from over 120,000 apartment buildings in Germany showed that approximately half already possess the requisite radiator capacity reserve for efficient heat pump operation. For buildings lacking this capacity, upgrading to higher-output radiator models is a viable solution. This approach could potentially prepare around 40 percent of buildings for heat pump integration. Naturally, this requires an appropriate infrastructure for the supply of electrical energy.

Professional operational management and heat contracting can significantly increase the efficiency of heating systems. In addition, monitoring and operational optimization offer further potential for boosting efficiency by 10–15 percent¹.

Greater efficiency through digitalization and professional operational management

Implementing monitoring and operational optimization can lead to a 10–15 percent reduction in final energy consumption, usually resulting in a better emissions rating for the building. This translates to annual savings of between EUR 66 and EUR 142 per apartment for tenants and substantial CO₂ savings for landlords.

Overall, it is clear that considerable CO₂ emission reductions are possible through efficiency-enhancing measures and professional operational management. Equipping all heating systems in apartment buildings with these solutions could result in an additional reduction in greenhouse gas emissions of around 4 million tons of CO₂e per year in Germany alone. There is an incentive for landlords to invest in these efficiency measures.

¹ Source: BaltBest: Influence of operational management on the efficiency of heating systems in existing buildings. Project duration: 1.12.2018- 30.11.2021. EBZ Bochum, Prof. Dr. Viktor Grinewitschus

Techem's new CO₂ index shows the relationship between actual CO₂ emissions and the emission targets for 2030 in multi-family buildings in Germany

The new index can be used to monitor and evaluate progress in reducing CO₂ emissions in the heating sector for apartment buildings. For example, the index provides a value of 160 percent for the Techem billing portfolio in 2022. This means that the German emission targets for 2030 will be exceeded by 60 percent in 2022, with actual emissions of 25 kg CO₂/m² of living space.

However, as the Techem CO₂ index varies depending on the energy source, it is worth taking a closer look: for heating oil, it was 230 percent, for district heating, 155 percent, and for natural gas, 150 percent in 2022. Buildings using electrically powered heat pumps are already at around 90 percent, based on the German electricity mix (wood pellets are not taken into account in the Emissions Trading Act and are therefore not considered in this context).

Summary

The debate about our future energy supply has moved into the spotlight, spurred by climate change and rising energy costs. Our 2022 consumption analysis provides an insight into current consumption and emission figures and shows the potential for efficiency improvements through monitoring and operational refinement. The growing adoption of heat pumps and the resulting heightened potential for optimization necessitates enhanced utilization and operational management. It is evident that energy efficiency must continue to improve and contribute to a secure, sustainable and affordable energy supply. Techem's CO₂ index helps quantify the progress made in reducing CO₂ emissions within the multi-family building heating sector.