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Weak economy slows down SMEs' climate investment – but large enterprises are achieving real growth

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KfW
KfW Research
Palmengartenstrasse 5-9
60325 Frankfurt / Main
Phone +49 69 7431-0, Fax +49 69 7431-2944
www.kfw.de

Authors
Anke Brüggemann
Phone +49 69 7431-1736
Dr Elisabeth Grewenig
Phone +49 69 7431-55722
Dr Johannes Rode
Phone +49 69 7431-40496
Dr Michael Schwartz
Phone +49 69 7431-8695

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Weak economy slows down SMEs' climate investment – but large enterprises are achieving real growth

Summary of the most important findings

German businesses increased climate-related investments by more than 5% in real terms
In the year 2023, enterprises in Germany increased their domestic climate investment by a nominal 12.1% overall to EUR 85 billion. Adjusted for price increases, that was a growth rate of 5.3%. Climate action has continued to gain in importance as an area of investment in the course of time. Whereas in 2021 only 12.8% of all business investment went into climate solutions, that figure rose to 16.1% already in 2022 and 17.1% in 2023.

Growth in climate-related investment is driven by large enterprises
Large enterprises continue to dominate investment activity. They expanded their climate investment once again considerably in 2023 from EUR 39 billion in the previous year to EUR 50 billion (+27% in nominal terms; +19% in real terms). By contrast, SMEs rolled back their climate investment – from EUR 36 billion to EUR 35 billion (-4% in nominal terms; -10% in real terms).

Difficult economic situation is weighing on SMEs' investment activity
In 2023, around 340,000 of the approx. 3.8 million enterprises in Germany completed climate-related investments, 150,000 fewer than in 2022. SMEs were the drivers of this development. A drop in investment was observable across all types of enterprises last year – from micro-businesses to large SMEs (between 2 and 6 percentage points). The main barriers to investment were the generally higher price level, rising financing costs and weak economic performance in Germany and around the world. Large enterprises, on the other hand, appeared to be able to handle the challenging economic environment better and continued to expand their investment activity (+8 percentage points).

Businesses funded most climate-related investments from their own resources
In 2023, small and medium-sized enterprises used own funds for most climate investments (46%), as they did in previous years. Bank loans made up 29% and promotional funds 22% of the funding mix.

A wide range of obstacles slow down climate investments in the business sector

The survey findings demonstrate that besides economic factors, a range of structural obstacles weigh on businesses' willingness to invest in climate action. The main barrier reported by enterprises was uncertainty around the cost-effectiveness of climate investments (47%). Insufficient financial resources (37%) were the second most frequently mentioned barrier, closely followed by lengthy planning and approval procedures (36%). This needs to be addressed to incentivise more climate investment in the business sector. Difficulties involving the availability of climate technologies, on the other hand, were clearly less relevant than in the previous year, falling from 41% to 26%.

Businesses continue to have climate action on their agenda
Half of businesses (51%) have taken climate action into account in their business strategy. That was a 12% drop on the previous year and mainly caused by micro-businesses and small businesses. The difficult economic environment is likely to have prompted businesses to move the issue onto the backburner. However, larger SMEs and large enterprises were seen to approach climate action very much from a strategic perspective (81% and 98%). This is likely due in part to regulatory requirements and demands from customers, investors and financial institutions, which expect larger enterprises in particular to make growing contributions to climate action.

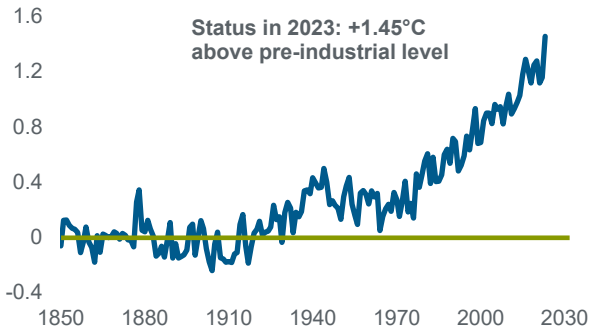
So far, only few enterprises have a climate neutrality goal of their own
Nine per cent of businesses claim to be aiming for net zero. Last year it was still 15%. Large enterprises continue to spearhead efforts. Of these, 80% aim to become climate neutral (+3 percentage points on the previous year). Larger SMEs follow at a significant distance (24%, -5 percentage points on the previous year).

Global warming continues unabated

The urgency to fight the global climate crisis with ambitious climate action is intensifying. The international community has not yet succeeded in curbing the growing atmospheric greenhouse gas concentration and, thus, rising global temperatures. In 2023, ground-level air temperatures averaged 1.45°C above the pre-industrial level (1850 to 1900). That means the warming trend has significantly accelerated since the beginning of the 1970s (Figure 1). It is estimated that the 1.5° limit set by the Paris Climate Agreement will already be exceeded in some of the years ahead.[1] Germany has already warmed by 1.8°C compared with the pre-industrial era.[2]

Figure 1: Average annual global air temperature change from 1850 to 1900

Change in °Celsius



Note: The zero line represents the global temperature average of the years 1850 to 1900.

Source: German Federal Environment Agency (2024).

The Earth's average global temperatures today are higher than at any time since the dawn of human civilisation.[3] The consequences of climate change are already visible in all regions of the world: an increase in extreme weather events such as heavy rainfall, flooding, heatwaves, drought, the melting of land and sea ice, and sea level rise. Every one tenth of a degree of global warming increases the risks which global climate change poses for humans, ecosystems and economic prosperity. But the good news is that the technologies that enable greenhouse gas emissions to be effectively reduced are known and most of them are already available.

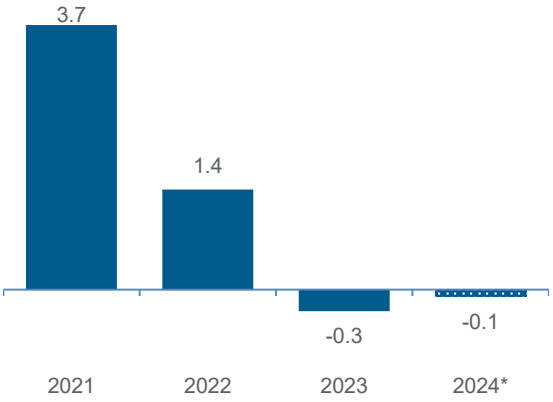
Necessary green transformation faces difficult economic environment

In order to effectively contribute to the fight against the global climate crisis, Germany has made an international commitment to reduce its greenhouse gas emissions by 65% compared with the 1990 baseline by the year 2030 (status in 2023: -46.1%[4]) and become climate neutral by 2045. Germany will need to mobilise some EUR 5 trillion in investment by the middle of the century in order to meet this target. A large portion of this investment – around 60% – will have to come from the private sector.[5]These figures illustrate that Germany cannot become climate neutral without a green transformation of its economy.

Currently, however, the investment required for the green transformation of industry and business faces a difficult economic environment, primarily driven by inflation-induced purchasing power losses, sharp increases in financing costs as a result of restrictive monetary policy measures and a generally weak global economy. Germany's gross domestic product (GDP) contracted slightly by -0.3% in 2023, after growing by 1.4% in real terms in 2022. The economic stagnation is likely to continue throughout 2024 (Figure 2).

Figure 2: Real GDP growth in Germany

In per cent on previous year



Source: German Federal Statistical Office (2024), *forecast according to KfW Business Cycle Compass (November 2024).

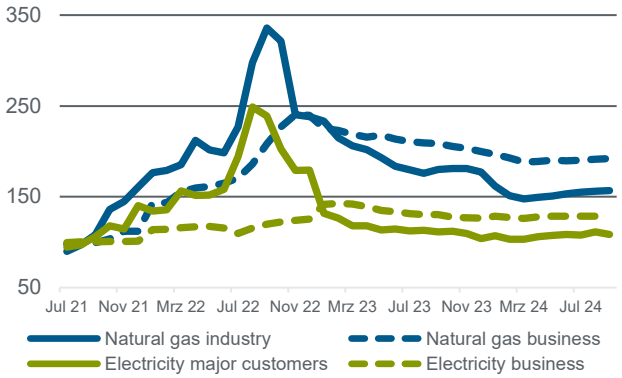
After energy prices had peaked in the summer of 2022 as a consequence of Russia's war of aggression against Ukraine, the prices of electricity and natural gas have now fallen again significantly. A look at the development of producer prices for electricity shows that the price for large customers has at least dropped back to near the pre-crisis level of the second half of 2021. Producer prices for commercial electricity users, on the other hand, remain around one third above the pre-crisis level. Producer prices for both industrial and commercial buyers of natural gas remain considerably above the pre-crisis level (Figure 3). The average producer price for natural gas for industrial users was around 60% higher in August 2024 than in August 2021 and around 94% higher for industrial users. Particularly for energy-intensive businesses, this represents a great burden and weakens their international competitiveness. A return to the consistently low natural gas prices from before the energy crisis, however, is not in sight since LNG (Liquefied Natural

Gas) supplies set the price floor on the natural gas markets. The necessary liquefaction process, shipping and regasification make LNG more expensive than pipeline gas.[6]

Risks from one-sided high dependencies on fossil fuel imports as well as the changed price path of natural gas have increased the urgency of the green transformation. The massive expansion of renewables and systematic advancement of energy efficiency are now also regarded as key strategies for enhanced energy security in Germany and Europe as well as energy affordability.

Figure 3: Development of energy prices in Germany

Index of producer prices (2021=100)



Source: German Federal Statistical Office (2024)

Third wave of KfW Climate Barometer gives insights into the investment behaviour of German businesses on the road to climate neutrality

How did climate investments in the business sector develop in this environment last year? The KfW Climate Barometer, which is published for the third time this year, provides answers to this question. As an annual tracking survey, it provides the only representative database for the investment behaviour of all German businesses – from micro-businesses to large enterprises – on the road to climate neutrality (see Box 1 for business size classes). It also delivers insights into the current attitudes and activities of German businesses around the topics of climate action and energy transition. Around 9,700 businesses took part in the survey, which was conducted between 12 February and 21 June 2024. More details about the methodology of the KfW Climate Barometer can be found at the end of this report (Box 5).

Box 1: Enterprise size classes

The KfW Climate Barometer divides businesses into five different size classes. These are defined as follows: **Micro-businesses** have fewer than five employees. **Small enterprises** have five to nine employees. **Medium enterprises** are defined as those that have ten to 49 employees. Companies with 50 and more employees are referred to as **larger SMEs** – provided their annual turnover does not exceed EUR 500 million. This turnover threshold applies analogously to all smaller size classes. **Large enterprises** are therefore defined as companies with an annual turnover exceeding EUR 500 million; their headcount does not play a role, however. In the following, only these designations will be used for ease of reading. Where the **SME sector** is additionally referred to as a collective, it comprises the first four size classes (i.e., the entire business sector not including large enterprises).

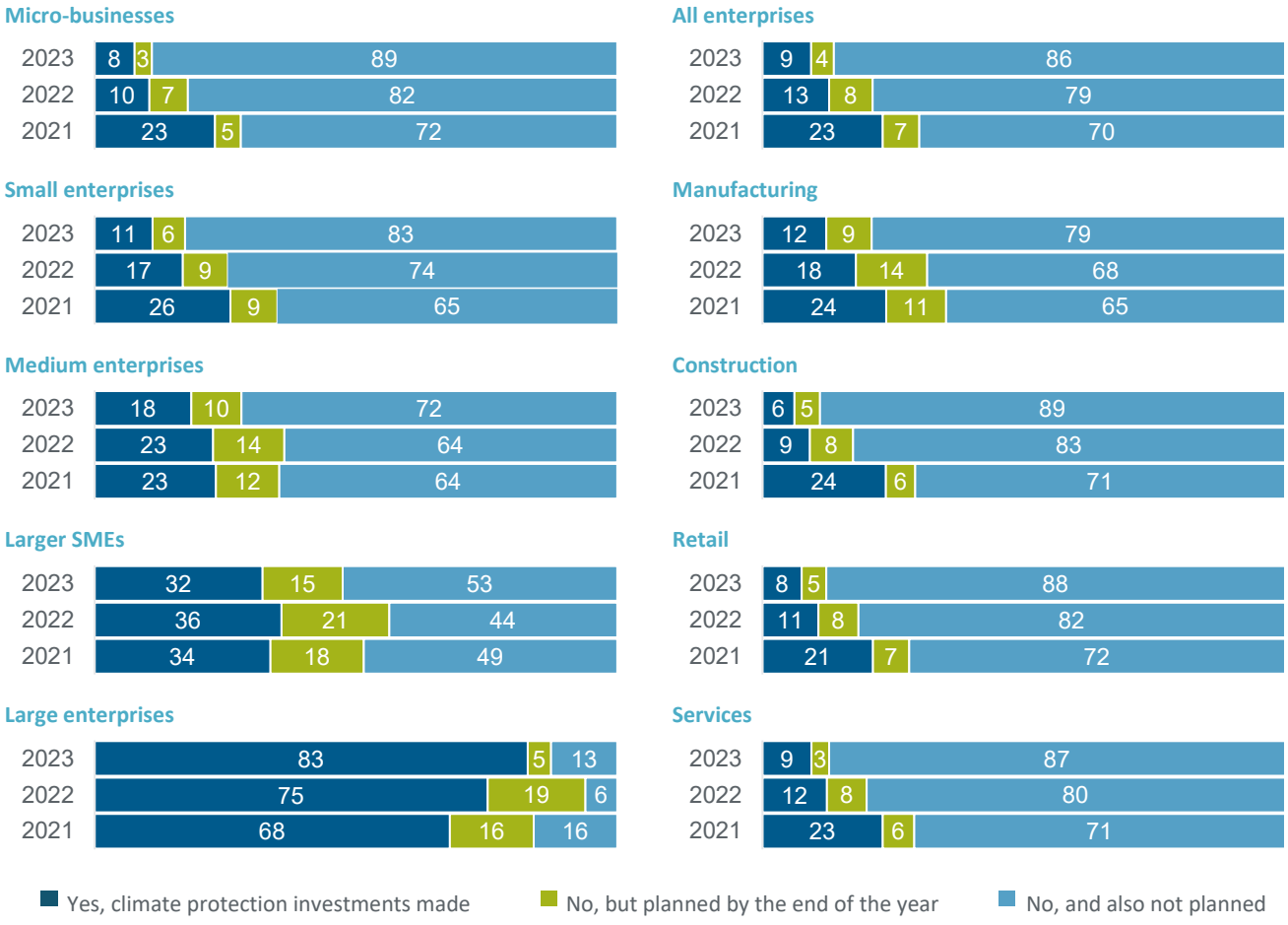
Challenging economic environment limits the willingness of German businesses to investment in climate action

Last year, the readiness of many enterprises to undertake climate investments fell noticeably. The proportion of enterprises with climate investments in Germany dropped by 4 percentage points in 2023 and now sits at only 9% (Figure 4). This is the lowest share of investments since the first survey for the year 2021. That year, the share of enterprises undertaking climate investments still stood at 23%. Climate-positive investments are defined as investments undertaken in measures aimed at avoiding or mitigating greenhouse gas emissions caused by the relevant business, although the intention to act on climate change did not necessarily have to be the top priority.

In 2023, a total of around 340,000 of the nearly 3.8 million enterprises in Germany completed climate-related investments, 150,000 fewer than in 2022. The difficult economic environment described above is likely to have acted as the main obstacle to investment.

Figure 4: Climate-positive investments undertaken by businesses in Germany

Share of enterprises in per cent



Note: The question was: 'Did your company carry out climate-positive investments in Germany?' It was also clarified that climate-positive investments meant investments in measures aimed at preventing or reducing greenhouse gas emissions which include, among others, investments aimed at conserving energy or increasing energy efficiency, measures that involve the use of renewable energy, or investments in climate-friendly mobility such as the acquisition of electric vehicles, for example. It was also noted that the climate action aspect of the investment decision did not have to be the top priority. This approach takes into account that businesses often do not consider climate action aspects in greater detail until they have to make replacement investments.

Source: KfW Climate Barometer 2022, 2023 and 2024

SMEs showed particular restraint, while large enterprises expanded their investment activities

A look at company sizes shows that small and medium-sized enterprises were responsible for the drop. A decline in investment activity was observable across all SME size classes last year – from micro-businesses to large SMEs – from 2 percentage points among micro-businesses to 6 percentage points among small enterprises. Large enterprises were the only ones that expanded their climate investment activity – and by quite a substantial 8 percentage points to 83%.

Thus, SMEs' willingness to invest in climate action is following a more general downward trend. According to the KfW SME Panel, overall investment activity of SMEs, which comprises not just climate action but many other areas such as replacements and investments aimed at increasing turnover, expanding capacities or digitalisation, also fell significantly last year.[7] The barriers to investment mentioned by SMEs were the generally higher price level, the overall economic slowdown in Germany and around the world, and legal requirements as well as rising financing costs. All these factors are also likely to have dampened SMEs' activity in climate action in 2023 (Box 2).

Box 2: (Economic) factors that influenced SMEs' investment activity

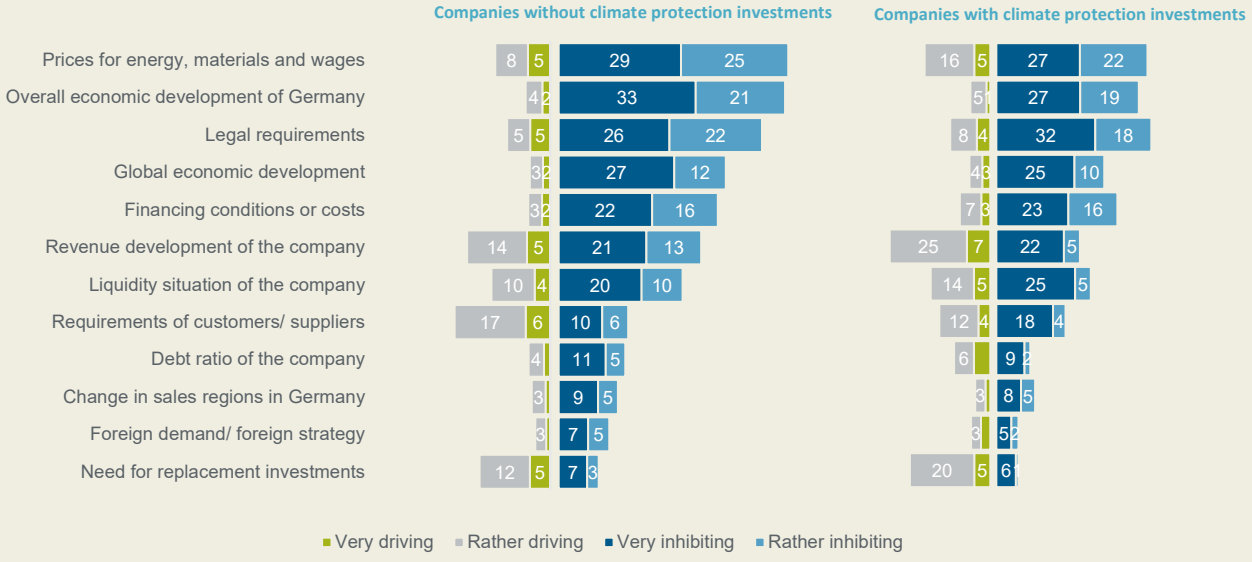
In 2023, the German economy was marked by stagnation – accompanied by high but declining rates of inflation. In order to ensure price stability, the European Central Bank raised key interest rates to 4.5% multiple times in quick succession up until September 2023. As a consequence, businesses' demand for credit dropped, especially from early 2023 onward.[8] This was compounded by weakening global growth momentum and further dampening effects caused by ongoing and new geopolitical tensions.

Asked about the underlying factors that influenced their overall investment activity in 2023, small and medium-sized enterprises often mentioned these very economic conditions as an impediment.[9] For small and medium-sized enterprises that did not undertake any climate investments in the year 2023, the increased level of prices of materials, energy and wages weighed most heavily on investment activity (54%) (Figure 5, left column). This was closely followed by the overall economic development in Germany (54%), legal requirements (48%), the development of the global economy (40%) and higher financing costs (38%). Although this group of enterprises also mentioned drivers of investment, such as demands from customers and suppliers (23%) and the development of their own turnover (19%), these drivers were generally less common and not strong enough to incentivise climate investments.

The obstacles mentioned above are also widespread among SMEs that completed climate investments in 2023 (Figure 5, right column). The top three were again legal requirements (50%), the increased price level (49%) and Germany's overall economic development (46%). Despite these barriers, the affected SMEs carried out climate investments nonetheless, thanks to a range of investment drivers which they mentioned significantly more often. Enterprises became active primarily when their business development provided a boost in terms of turnover (32%) or liquidity (19%), or when they needed to make replacement investments (25%). Even so, the increased prices for energy, materials and wages provided important impetus to around one fifth of SMEs (21%) with climate investments. Although the increased prices are putting pressure on many enterprises, higher prices for fossil fuels can also provide an incentive to invest in energy or resource efficiency measures in order to offset the higher price level in the long term.[10]

Figure 5: Barriers and drivers of investment in the SME sector

In per cent; by SMEs with and without climate investments in 2023



Note: The question was: 'How did the following underlying factors affect the investment activity of your company in 2023?'

Sources: KfW SME Panel 2024, KfW Climate Barometer 2024

The fact that large enterprises have expanded their investment activity in the field of climate action as opposed to SMEs is likely due in part to the circumstance that they face significantly higher pressure from external stakeholders. Not only are their activities more often the focus of public reporting, large enterprises are also subject to more stringent transparency requirements around climate action – for example in the context of EU Taxonomy, the EU Sustainability Reporting Directive (CSRD) and the German Act on Corporate Due Diligence Obligations in Supply Chains. Accordingly, compliance with legal regulations (72%), customer demands (64%) and avoiding reputational risks (58%) constitute key motives for their climate investments.[11] At the same time, large enterprises are already seizing more of the opportunities provided by the climate transformation. For example, more than half of large enterprises have stated that ambitious climate action enables them to access new sales markets (Figure 20).

Furthermore, larger enterprises are significantly more likely to mainstream climate action in their business strategy than smaller and medium-sized enterprises and to pursue specific greenhouse gas reduction plans (Figures 16 and 19). It can therefore also be assumed that the climate investments undertaken by large enterprises were already planned longer in advance and implemented accordingly. By contrast, smaller enterprises are likely to have more short-term investment plans. Accordingly, recent developments such as a renewed drop in energy prices, weak economic performance and uncertain economic conditions in 2023 presumably have a greater influence on their investment activities.

Irrespective of the different developments, previous patterns remain in place (Figure 4). The proportion of enterprises with climate investments in 2023 was around four times as high among larger SMEs as among micro-businesses (32 vs. 8%) and more than twice as high among large enterprises (83%) as among large SMEs. There are various reasons for this. Besides the reasons already mentioned, larger enterprises generally also have more human or financial resources to push ahead with such investments.

In a sector comparison, too, there is evidence for a growing reluctance to invest across all business segments over time. The shares of enterprises with climate investments in the manufacturing sector fell relatively steeply in 2023 – by 6 percentage points year on year. In the remaining sectors the decline was 3 percentage points. Investment activity in manufacturing thus converged with that of other sectors in the year 2023 (12 vs. 9% in the overall corporate sector), closing what was still a major gap to construction, commerce and services in 2022 (18 vs. 13% across the entire corporate sector).

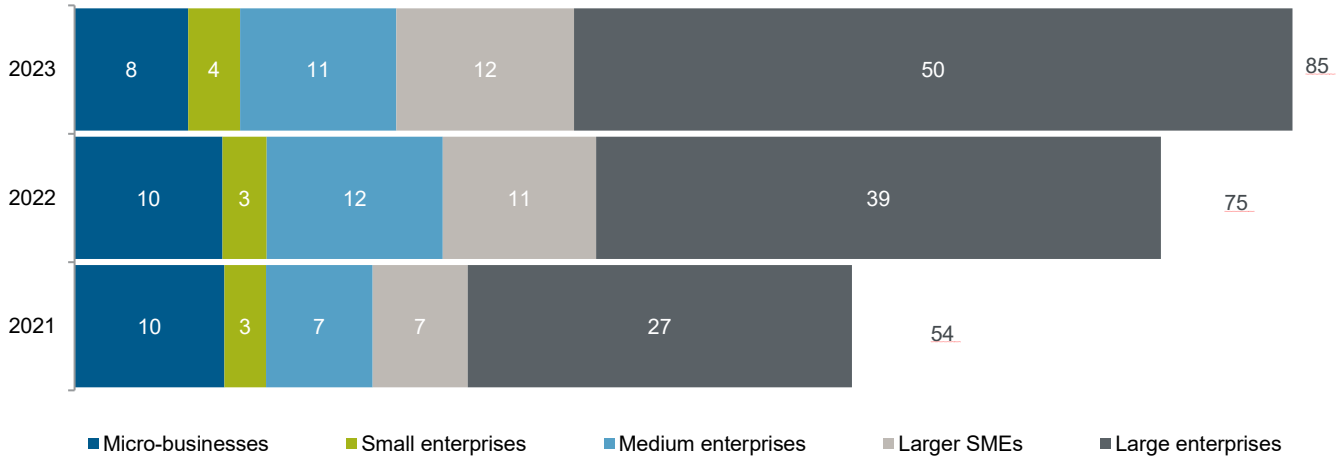
Aggregate domestic climate investment in the corporate sector grew to EUR 85 billion – an increase of 5% in real terms

Total domestic investment in climate action by German enterprises amounted to some EUR 85 billion in 2023 (Figure 6). This was a nominal increase of just under EUR 10 billion or around +12.1% year on year. Considering the price increases of the past year, it also shows an upward movement in real terms (+5.3%). A look at last year's EUR 496 billion in total gross fixed capital formation in the corporate sector underscores that climate investments are being given greater priority than in the past. Whereas 17.1% of all investment went to climate action in the past year, that figure was still lower in the years 2022 and 2021, at 16.1 and 12.8% (total corporate investment on the basis of national accounts, as at August 2024).[12]

A comparison of current investment activity with the volume of investment required for Germany to achieve its goal of climate neutrality also shows, however, that businesses still need to significantly ramp up their investment efforts. On average, the private sector needs to invest around EUR 120 billion each year (plus price increases over time) in order to achieve net zero by 2045. That means there is currently a shortfall of at least EUR 35 billion[13] across the entire business sector, in addition to further investment requirements to close the gaps of previous years.[14]

Figure 6: Climate investments by enterprise size classes

Volume in EUR billions per size class



Note: Box 5 shows details on the calculation of investment amounts used for climate solutions.

Source: KfW Climate Barometer 2022, 2023 and 2024

Large enterprises offset investment decline among SMEs

The total volume of funds invested in climate solutions masks significant differences by enterprise size (Figure 6). Large enterprises continue to dominate investment activity. In 2023, they expanded their climate investment once again considerably from EUR 39 billion in the previous year to EUR 50 billion (+27% in nominal terms; +19% in real terms).[15] Climate action investments have thus become more important yet again as an area of investment for large enterprises. Whereas in the years 2021 and 2022 large enterprises invested 11 and 15% of their total new investment in climate solutions, that figure already rose to 18% in 2023.

By contrast, SMEs rolled back their climate investment last year – from EUR 36 billion to EUR 35 billion (-4% in nominal terms; -10% in real terms). This decline is mirrored in the share of climate investments in gross fixed capital formation in the SME sector. Thus, total investment activity by SMEs still grew by EUR 8 billion or 4% at least in nominal terms in 2023 (to EUR 219 billion; -2% in real terms).[16] Accordingly, the share of climate action investments in total SME investments fell proportionately from 17.1% in the year 2022 to now 15.9%. Compared with the year 2021 (14.9%), however, a slight increase can nonetheless be identified.

The fact that investment in climate action did not decrease overall in 2023 is due to the increasing investment activity of large enterprises. Micro-businesses rolled back their climate investments (-23% in nominal terms from EUR 10 to EUR 8 billion; -28% in real terms), as did medium enterprises (-11% in nominal terms from EUR 12 to EUR 11 billion; -17% in real terms). Small businesses still recorded growth (+17% in nominal terms from EUR 3 to EUR 4 billion; +10% in real terms), as did large SMEs (+16% in nominal terms from EUR 11 to EUR 12 billion; +9% in real terms).

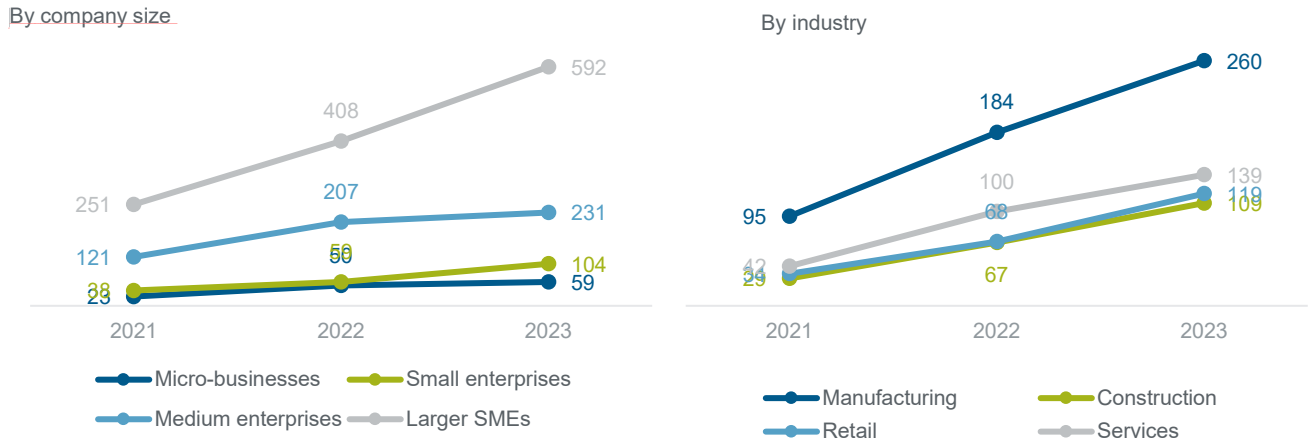
SMEs with climate investments significantly increased average investment volumes

Even if the volume of funds invested by SMEs in climate action fell overall, enterprises that completed at least one climate-related investment significantly expanded again the average investment volumes allocated for that purpose over time. This finding holds trued in all the enterprises size classes and sectors (Figure 7).

Accordingly, the average amount invested by an SME (assuming it made any climate-related investment at all) grew from EUR 106,000 to EUR 146,000 in 2023. This equals a rise of +38% in nominal terms. Even when accounting for the rate of price increases between the years 2022 and 2023 (+6.5% annual average for gross fixed capital formation), the increase was still a strong +30% in real terms.

Figure 7: Comparison of average volumes invested in climate-positive projects by SMEs

Average per enterprise in EUR thousands; only SMEs that implemented investments with a climate focus.



Source: KfW Climate Barometer 2022, 2023 and 2024

Whereas an increase in average investment volumes could be observed in all segments of the SME sector, in a size comparison it was small businesses that recorded the strongest growth. They expanded their average investment amount by a nominal 76% to EUR 104,000 (66% in real terms), thereby catching up with the other size classes. In a sector comparison, commerce stood out with a 75% increase (64% in real terms) to EUR 119,000 on average.

At the same time, the median value also rose slightly. That means half the investment projects by SMEs in 2023 had a volume of less than EUR 35,000 (2022: EUR 30,000). That was a nominal increase of +17% (+10% in real terms) on the previous year. Thus, enterprises that still had sufficient capacity for climate-related investments boosted their investment volume substantially.

Irrespective of growing average project sizes, smaller projects continue to dominate investment activity in the area of climate action. Across all segments, the average sum invested by an SME in a climate-positive project was EUR 146,000. By comparison, investment projects in general have an average size of EUR 200,000.[17] The amounts which businesses allocate to climate action investments on average grow significantly with the size of the enterprise. In a sector comparison, manufacturing enterprises stand out as their average investment volumes are significantly higher than in all other sectors.

Nearly half of all businesses invested in climate-friendly mobility, more than one third in renewable energy

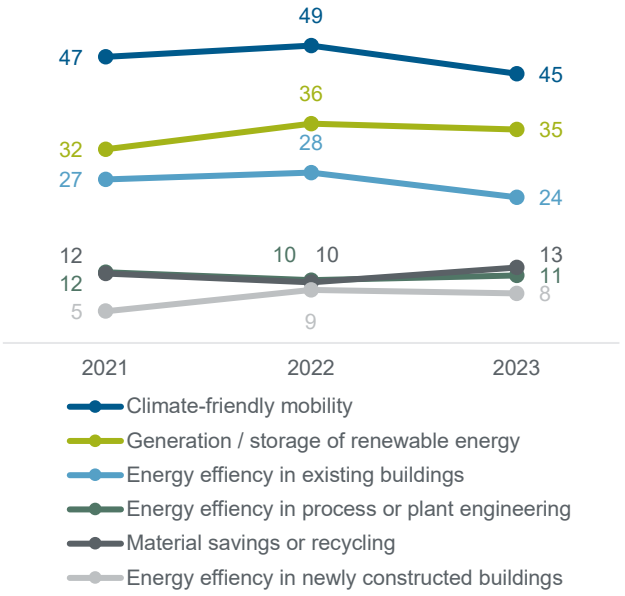
The order of priority of climate-positive measures implemented remained almost unchanged in 2023. Businesses primarily implemented measures in the field of climate-friendly mobility (Figure 8). Almost half of those making investments (45%) carried out such projects, which included the acquisition of an electric vehicle or related charging infrastructure, for example. The high share of investments in mobility is probably due to (almost) all businesses having at least one company car. In mid-2023, however, only one in five company cars were electric, so accordingly, the need for further investment is high.[18] At the same time, mobility measures have become less important than in the previous year (-4 percentage points). This decline can likely also be attributed to the end of subsidies for the purchase of plug-in hybrid vehicles (at the beginning of 2023) and commercially operated fully electric passenger vehicles (from September 2023).[19]

As in previous years, around one third of investing enterprises (2023: 35%, 2022:36%) implemented measures for generating or storing electricity or heat from renewable energy sources. The third most frequent measures were investments aimed at making existing buildings more energy-efficient (for example by installing thermal insulation or heat pumps), with 24% of investors active in this area, 4 percentage points fewer than in 2022.

Measures aimed at reducing consumption of materials or recycling followed at some distance (2023: 13%), as did measures aimed at improving energy efficiency in process or systems engineering, for example in production and cooling (2023: 11%). Around 8% of investing businesses carried out energy efficiency measures in newly constructed buildings. Investments in hydrogen technologies still have no relevance across the wider business landscape.

Figure 8: Purposes of climate-positive investments

Share of investors, multiple responses were possible.



Source: KfW Climate Barometer 2022, 2023, 2024

Box 3: SMEs' climate investment activities by area and sector

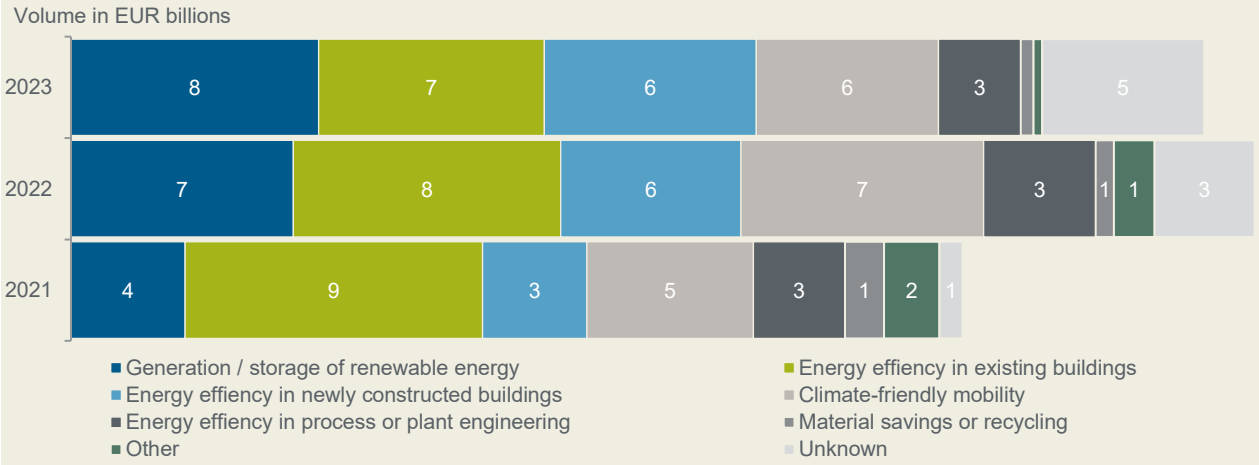
Figure 9 shows estimates of the volume of investments allocated by SMEs to individual areas. Figure 10 includes estimates by sector.

A look at the various areas shows that in 2023, investments in the generation/storage of renewable energy increased yet again (from EUR 6.8 billion to EUR 7.6 billion, +11% in nominal terms). Thus, investment in this area remained on a high level after nearly doubling with the beginning of the energy crisis because of Russia's war of aggression against Ukraine in 2022. This was likely due to the steep declines in the prices of photovoltaic systems in 2023.[20] Together with the recently introduced amendments to the Renewable Energy Sources Act, which led to higher feed-in tariffs and simplified rules for the installation of rooftop systems in 2023, investing in photovoltaic systems has likely paid off for an increasing number of enterprises. This had a corresponding impact on the investment figures for this category.

While climate-friendly mobility tops the list by a large margin with respect to the number of investing businesses, buildings are clearly the area receiving the highest volumes of investment. Investments in the energy efficiency of existing and newly erected buildings amounted to EUR 13.4 billion in 2023, representing 39% of the total volume of SMEs' climate investment. A sharp increase on the previous year was recorded in energy efficiency investments in newly constructed buildings (from EUR 5.5 billion in 2022 to EUR 6.5 billion in 2023, +18% in nominal terms). At the same time, however, investments in energy efficiency measures for existing buildings dropped from EUR 8.2 billion in 2022 to EUR 6.9 billion in 2023 (-16% in nominal terms).

As with the number of investments, the volume of investments in climate-friendly mobility also decreased, from EUR 7.4 billion in 2022 to EUR 5.6 billion in 2023 (-24% in nominal terms). Investments in energy efficiency in process or systems engineering (EUR 2.5 billion) and reducing material consumption or recycling (EUR 0.4 billion) remained on a low level in 2023.. By comparison with the previous year, investments fell (-27% and -30% in nominal terms).

Figure 9: Volumes allocated by SMEs to climate investments by area

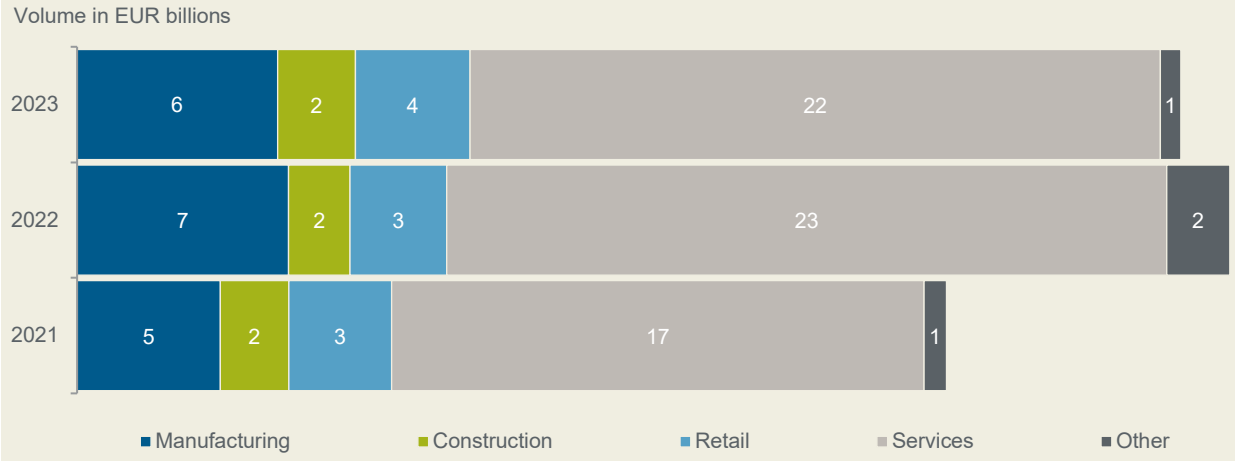


Source: KfW Climate Barometer 2022, 2023, 2024

A sector comparison reveals that commerce (from EUR 3 billion in 2022 to EUR 3.6 billion in 2023, +18% in nominal terms) and construction (from EUR 1.9 billion to EUR 2.5 billion, +27% in nominal terms) expanded their climate investments. In the remaining sectors those investments decreased.

Service businesses implemented the lion's share of SMEs' climate investment (63% or just under EUR 22 billion) due to the large number of enterprises in this sector. Other services (without commerce) comprise 2.4 million businesses alone, which represents 64% of all businesses.

Figure 10: Volumes allocated by SMEs to climate investments by sector



Source: KfW Climate Barometer 2022, 2023, 2024

Businesses funded most climate-related investments from their own resources

Observations can be made about the ways in which small and medium-sized enterprises financed their climate investments. Most of the climate investments made by SMEs were funded from their own resources. These included internal financing and, to a lesser extent, shareholder contributions and intra-group funding models (Figure 11). In the aggregate across all SME size classes, own funds made up a share of 46% in the year under review. Purely internal funding – from retained earnings, depreciations and reserves – accounted for the lion's share of around 40% of the funding mix alone. The importance of own funds in the financing of SMEs' climate investments has thus remained quite steady on a high level over the course of time. This is also in line with the funding pattern of all investments by SMEs, 51% of which are financed with their own funds.[21]

The relevance of promotional funds for the funding of climate-positive projects has been similarly steady. In the year under review, SMEs used promotional funds to finance some 22% of the corresponding investment volume.

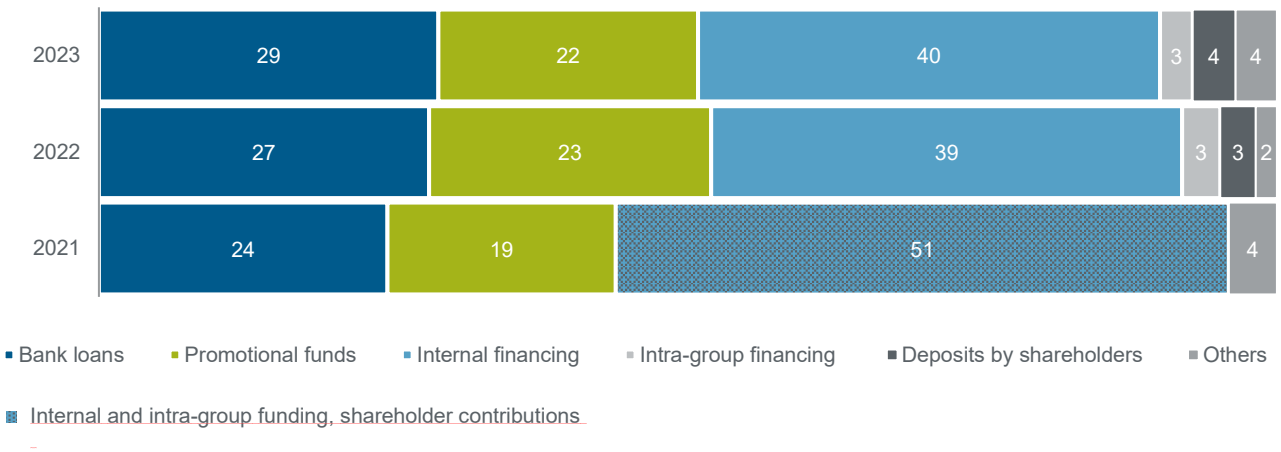
Borrowing has grown moderately

The financing environment for SMEs deteriorated in 2023. High interest rates, more restrictive access to credit and weak investment momentum greatly diminished demand for investment loans from SMEs. At the same time, the success rate for those that were in loan negotiations dropped and the loan rejection rate increased, especially for smaller businesses. Overall, the number of enterprises with bank loans in the funding mix for their general investments fell sharply (-32%).[22] But on balance, as average loan amounts were on the rise across the wider corporate sector, the share of loans in the funding mix for overall SME investment activity remained unchanged at 32%.

By contrast, the share of loans from banks and savings banks used to finance climate investments (including current account loans and overdraft facilities) rose slightly in 2023. Around 29% of the investment volume mobilised by SMEs for climate action projects was financed with the aid of bank loans. That was the second minor consecutive increase (2022: 27% / 2021: 24%). The importance of loans therefore continues to converge to the comparison value as part of SMEs' general investment financing (2023: 32%). The increase in the significance of credit financing can presumably be largely attributed to the increase in average investment volumes in 2023. Borrowing requirements tend to increase with growing project volumes.

Figure 11: Funding of climate investments by SMEs

Share of investment volume in per cent



Note: 'Other sources' include, among others, publicly traded capital market instruments such as bonds and shares. The survey for the year 2021 did not distinguish between internal funding, intra-group funding and shareholder contributions but combined these funding forms as 'own funds'.

Source: KfW Climate Barometer 2022, 2023, 2024

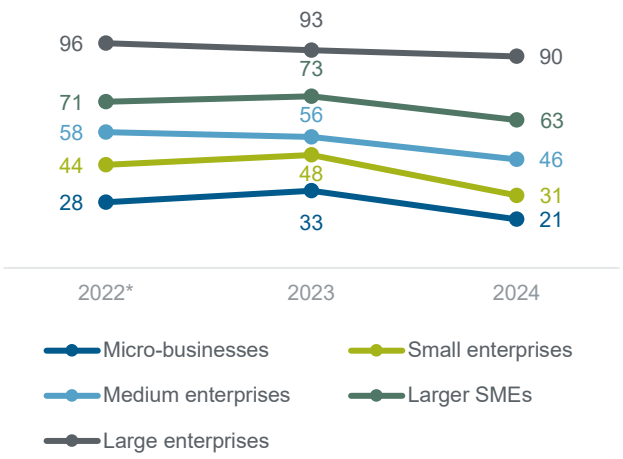
One quarter of enterprises have medium-term plans to expand climate investments – fewer than ever

Currently, around one quarter (25%) of all enterprises plan to increase their climate investments in the next three years. That is a higher share than the proportion of businesses that carried out climate investments in 2023 (9%). That is why investments in climate action could become more important again.

A look at the development of medium-term plans since the year 2022, however, reveals that businesses are currently rather reluctant as to how they intend to shape their climate investments in the future (Figure 12). Thus, the share of enterprises that want to expand their climate investments in the next three years has fallen in all segments, in some very sharply.

Figure 12: Expected development of climate investments in the next three years

Share of SMEs responding they will *significantly* or *slightly increase* investment, in per cent



Note: * In the survey year 2022 (1st wave of the KfW Climate Barometer), a slightly longer period – the next three to five years – was used to analyse the expected development.

Sources: KfW Climate Barometer 2022, 2023, 2024

One likely reason is the continuing subdued overall economic development in Germany, which has already acted as a dampener on (climate) investment in the past year. The interest rate reversal initiated by the European Central Bank, however, may provide modest impetus in the medium term. Businesses have stated that looking ahead, any investment stimuli resulting from the key interest rate reversal may benefit transformation projects in digitalisation and climate action.[23] And an expected consumption-driven economic recovery from 2025 may also provide a better starting point for climate investment projects in the future.

Businesses face various obstacles to the implementation of climate investments

The findings of the KfW Climate Barometer show that apart from economic factors, many structural barriers negatively affect businesses' investment activity in the area of climate action (Figure 13). Topping the list are cost-effectiveness and financing aspects. But internal and external conditions such as lengthy approval procedures, the availability of materials, the existence of human resources or adequate information about greenhouse gas mitigation options are also important criteria for businesses.[24] Moreover, around one third of businesses (34%) agree with the statement that climate action plays a secondary role for their business and that other issues are therefore more important.

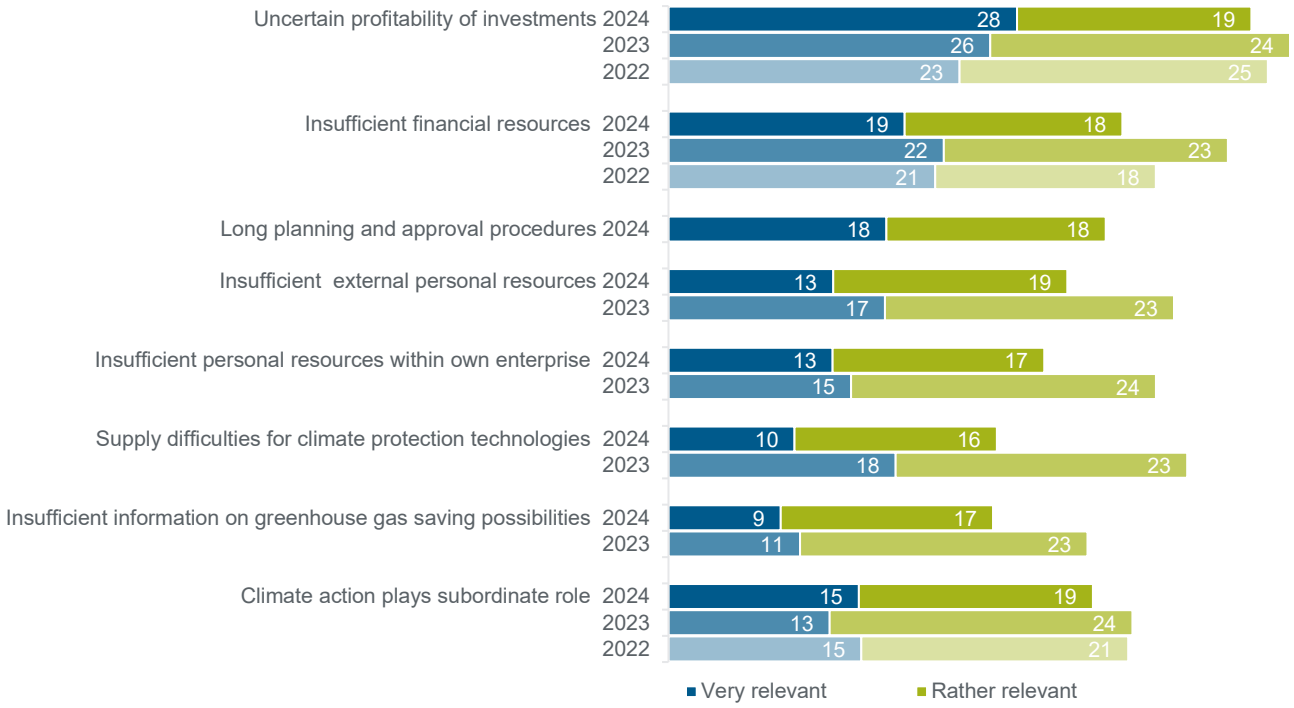
Insufficient cost-effectiveness and lack of financial resources were the barriers mentioned most often

The most pressing barriers to investment can be traced back to economic and financial aspects. More than one fourth (28%) of all businesses reported uncertainty over the cost-effectiveness of their investment as a very relevant barrier to the implementation of climate investments, while a further 19% consider it a rather relevant issue. In total, that represents nearly half of all businesses (47%), a slight decrease from the previous year (50%). A lack of financial resources was regarded as a relevant barrier by 37% of businesses (19% saw it as very relevant, 18% as rather relevant). Again, there is a relevant decline of 8 percentage points on the previous year.

In a sectoral view, what stands out is that manufacturers rate insufficient cost-effectiveness as a relevant or very relevant barrier (50%, Figure 14). In addition, Figure 14 shows that the higher the share of energy costs in an enterprise's total costs, the more likely that enterprise is to regard insufficient cost-effectiveness as a barrier to climate investment. It is also more likely to be a relevant barrier to climate investments of larger enterprises, which are most likely to be manufacturing firms. This might be because these business segments are more exposed to international competition and therefore face greater cost pressure. Many companies are challenged by the fact that because of market imperfections, climate action projects often have an even worse risk-return profile than 'non-green' investment alternatives.

Figure 13: Barriers to climate investment

Share of enterprises in per cent

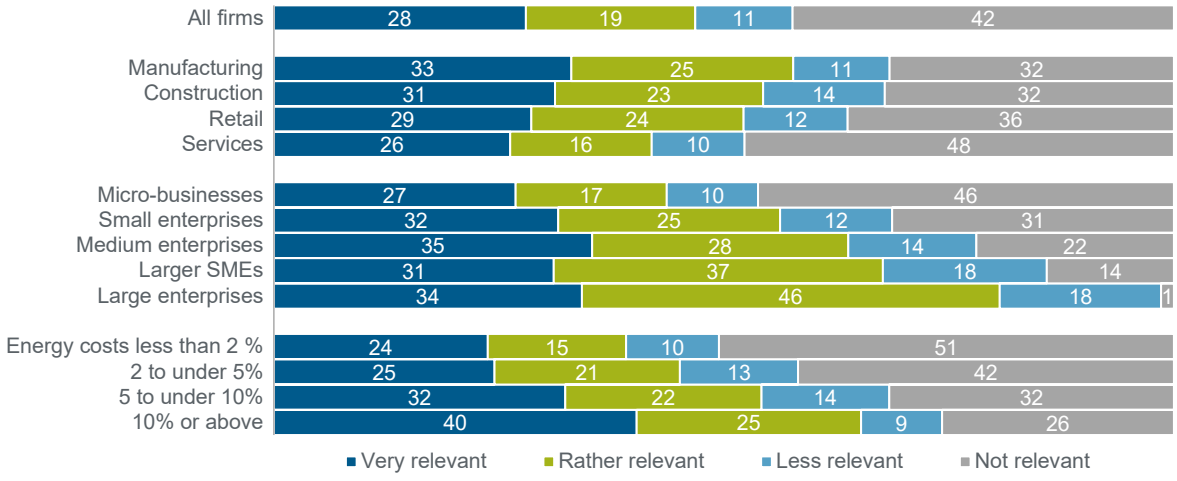


Note: The question was: 'How relevant are the following barriers to the implementation of climate-positive investments in your enterprise?' The response categories were 'very relevant', 'rather relevant', 'not so relevant', 'not relevant'. We report here on the share of enterprises that responded 'very relevant' or 'rather relevant'. Some items changed compared with wave 1 or 2, so that statements cannot be made for all categories.

Source: KfW Climate Barometer 2022, 2023, 2024

Figure 14: Insufficient cost-effectiveness as a barrier to climate investment

Share of enterprises in per cent



Note: The question was: 'How relevant are the following barriers to the implementation of climate-positive investments in your enterprise?' Here, only the shares for the barrier 'Cost-effectiveness of investment too uncertain' are presented. The response categories were 'very relevant', 'rather relevant', 'not so relevant', 'not relevant'.

Source: KfW Climate Barometer 2024

More than one third of enterprises reported lengthy planning and approval procedures as a barrier

Protracted planning and approval timeframes were mentioned as the third most serious investment obstacles. They were regarded as a relevant barrier by 36% of businesses (18% described it as very relevant, 18% as rather relevant).[25] This finding matches that of the KfW Climate Barometer 2022, which identified that businesses' main appeal to policymakers was to simplify planning and approval processes in order to promote climate investments. At the time, 64% of businesses gave this response.[26] One cause for optimism that this is indeed happening are first signs, for example, in the expansion of wind energy. A range of measures aimed at releasing new sites and speeding up approval processes were implemented in Germany, and this indeed led to significantly more wind energy capacity being approved.[27]

Economic slowdown means skills shortages are hampering climate investment less than in the previous year, but impact remains high

The shortage of skilled workers is now a widespread and growing problem in Germany.[28] While the share of businesses that saw skills shortages as a barrier was around 10% in 2009, that figure has since more than tripled. At the start of the second quarter of 2024, 35% of businesses in Germany reported that skills shortages were affecting their operations.[29] A major reason for this development is the successive departure of post-war baby boomers from the workforce.

In light of these developments, it is intuitively plausible that many businesses see skills shortages as a barrier to the green transformation. Thus, around 30% of businesses regard the lack of in-house human resources as a relevant barrier to the implementation of climate projects (Figure 13). However, that share has dropped by nearly 10 percentage points on the previous year. When recruiting skilled labour for their decarbonisation, businesses generally face the challenge that these positions require specific skills that differ from those otherwise required by the company.[30] The qualifications required range from regulatory and commercial skills that are of relevance to the strategic implementation of climate action plans to specific digital and technical skills needed for the installation of technologies.

The success of many climate action projects, however, depends not only on the qualifications of internal employees but often on the availability of external expertise as well. Tradespeople who are involved in the installation of energy systems, with their various advisory, assembly and maintenance activities, are a good example of this.[31] A share of 32% of businesses mentioned a lack of external expertise as a relevant barrier to the realisation of climate investments (Figure 13). Again, there was a significant drop of 8 percentage points in the degree to which they are affected compared with the previous year.

Overall, skilled labour shortages have become much less of a barrier to the implementation of climate investments compared with the previous year. This is most likely due to the economic slowdown, which has reduced the demand for skilled workers.[32] But skills shortages still pose a burden for around one third of enterprises and are likely to worsen again when the economy picks up pace. Easing the shortage of skilled labour requires measures such as bringing more women and older workers into the workforce and attracting and integrating skilled migrants. This applies to all jobs but to climate-related activities in particular. Furthermore, training and ongoing education offerings must be tailored to companies' changed skills requirements so that skills shortages do not become a bottleneck in the green transformation in the future.

Supply issues have decreased significantly as a barrier to climate investment

Problems in the supply of raw materials and inputs have become a more prominent factor since the beginning of the COVID-19 pandemic. This trend has even worsened temporarily with the outbreak of Russia's war of aggression against Ukraine. Many businesses now perceive supply bottlenecks as a risk to Germany's competitiveness.[33] Today, around one quarter of enterprises (26%) mention supply difficulties (for example for heat pumps and photovoltaic systems) as a relevant barrier to the realisation of climate investments (Figure 13). That was a sharp 15% drop on the previous year, the steepest decline measured against the development of the remaining reported barriers. The situation has generally eased because the material shortages in German industry have decreased considerably and are now almost back to pre-pandemic levels.[34] The findings of the KfW Climate Barometer now confirm this trend for climate-friendly goods as well.

Information gaps about ways to reduce CO_2 emissions are closing

Having adequate knowledge of the areas in which climate action projects can be tackled is an important precondition for businesses to approach them in a targeted manner. The data of the KfW Climate Barometer shows that lack of information about ways in which they can reduce their greenhouse gas emissions

are a relevant barrier to climate investments for around one quarter of enterprises (26%). A positive aspect is that the gap is clearly closing. In the previous year, 34% of businesses were still lacking this information (Figure 13). Information deficits are most pronounced among small and medium SMEs. Whereas only 17% of large enterprises (24% in the previous year) stated that lack of information about possible ways to cut emissions was a relevant barrier for them, that figure was 26% among SMEs (34% in the previous year). The difference between the size classes and the variation must be seen against the background that sustainability reporting obligations and due diligence requirements vary. In the past, large enterprises already had to deal with their greenhouse gas emissions and the reduction potentials of their operations.

Services known as transformation advice can be helpful in reducing information gaps among smaller businesses and medium SMEs. This involves identifying approaches for green business practices in individual enterprises with the aid of external advisers. The insights gained in this way enable businesses to carry out climate action investments in a more targeted manner and focus their greenhouse gas reductions on areas in which they can achieve the greatest effect.

Half of businesses have taken climate action into account in their business strategy

One way of finding out how much enterprises deal with climate action was to ask to what extent it part of their business strategy. It became evident that decarbonisation continued to have high strategic relevance for many businesses in Germany. Around half (51%) agreed fully or in part with the statement that climate action was part of the business strategy (Figure 16). In the previous year, however, that figure was still 63%. The share of enterprises that integrated climate action fully into their corporate strategy decreased on the previous year (from 27 to 23%), as did the share of those that partly integrated it (down from 36 to 28%). The share of companies that did not describe climate action as part of their strategy rose accordingly from 28 to 38%. As a result, the value for the year 2024 almost matched that of 2022 again (39%).

If we understand a business strategy as a company's long-term direction, it may surprise that fewer enterprises now include climate action in their business strategy than in the previous year. However, the decline in the level of support may indicate that the respondents interpreted the statement more broadly, possibly in the sense that they were currently incorporating climate action into their business actions. Last year, the energy price crisis likely caused businesses to give more attention to climate aspects such as energy efficiency improvements or the expansion of renewables. Since other issues are now shaping the economic policy debate again, the focus appears to have shifted away from the topic of climate action.

The sector comparison reveals that manufacturers have factored climate action more strongly into their strategic planning than the trade and service sectors. It is in manufacturing, in particular, that the green transformation is associated with substantial upheavals for many businesses. In order to be able to put climate-neutral business models in place, they must modify products (for example in the automotive industry) as well as production processes (for example in paper and steel production). And it still holds true that the larger the enterprise, the more likely it is to have anchored climate action in its business strategy. Almost all large enterprises – 98% – have dealt with climate action as a strategic issue.

With respect to energy costs, low-energy firms in which energy makes up less than 2% of costs also see climate action as having the lowest strategic relevance (46%). Among the more energy-intensive enterprises, on the other hand, the share is significantly higher, at just under 60%, but does not grow further with rising energy cost shares.

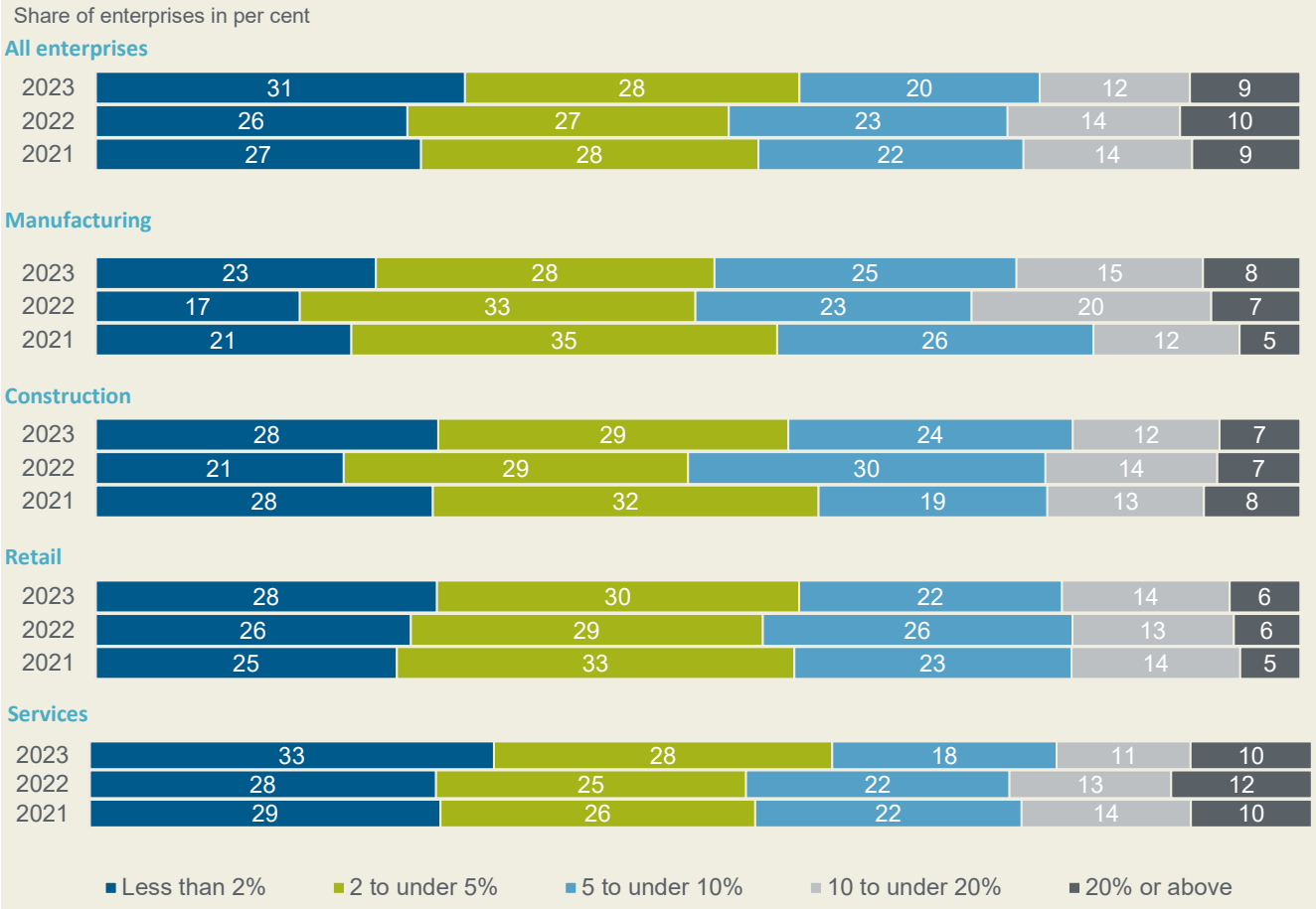
Box 4: Development of energy costs in enterprises

With Russia's war of aggression against Ukraine, businesses in Germany were exposed to very volatile energy prices. The situation in the energy markets has eased in the meantime after prices peaked in the year 2022. But prices remain on a higher level than before the beginning of the energy price crisis (Figure 3).

Data from the KfW Climate Barometer show that the relative burden from energy costs – measured as the share of energy costs in businesses' total costs – has remained largely steady throughout the overall crisis period since 2021 (Figure 15). Thus, energy costs made up less than 5% of total costs in 58% of businesses in the year 2023, whereas that share was 53% the year before and 55% in 2021. At the same time, the share of enterprises that had a high relative energy cost burden of at least 10% fell slightly to 22% (2022: 24%, 2021: 23%). Across all businesses, energy costs thus continue to play a rather subordinate role compared with other costs. One important reason for the largely steady energy cost burden is that most enterprises responded early to the increased energy prices and put in place energy-saving measures.[35]

In a sector comparison, manufacturers stand out. Their relative burden from energy prices has fallen back below the peak of the year 2022 but remains well above the level of 2021. While most other sectors use fossil fuels primarily to heat their factory buildings or to drive vehicles, manufacturing firms often use them in larger quantities for their production processes.[36] Although the increased energy prices continue to pose a significant burden for many businesses in this sector, they also set incentives for measures to increase energy and resource efficiency or invest in renewables, which offset the price increases in the long term.

Figure 15: Shares of energy costs in total costs

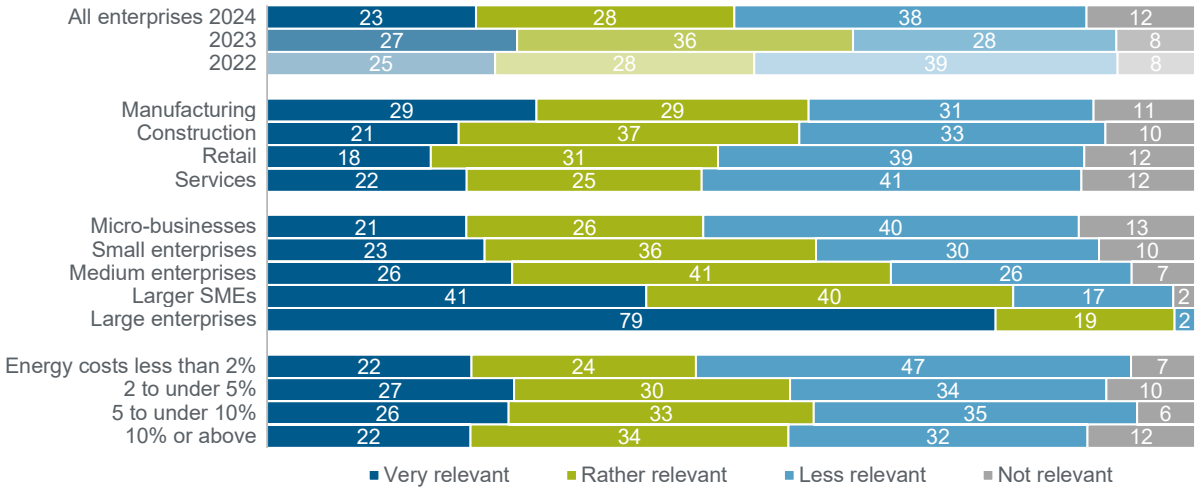


Note: The question was: 'How high was the share of energy costs in your company's total costs?'

Source: KfW Climate Barometer 2022, 2023, 2024

Figure 16: Climate action as part of the business strategy

Share of enterprises in per cent



Note: The question was: 'To what extent does the following statement on the issue of climate action apply to your business? Climate action is incorporated into our business strategy.' Energy cost share means the share in total costs incurred by the business.

Source: KfW Climate Barometer 2022, 2023, 2024

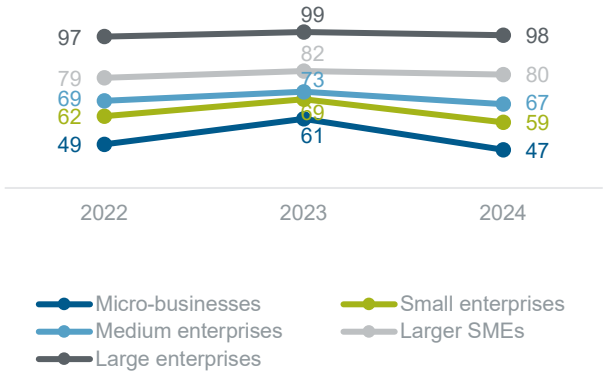
Strategic anchoring of climate action decreased among smaller businesses in particular

Compared with the year 2023, the proportion of enterprises that mentioned climate action as being at least part of their business strategy fell in companies of all size classes and sectors regardless of the share of energy costs in total costs. The services sector recorded the steepest decline in absolute terms, -15 percentage points. In commerce it was -12 PP. With regard to enterprise size, the drop was -15 PP among micro-businesses and -10 PP among small enterprises (Figure 17). It is fair to assume that smaller businesses only rarely write down their business strategy and the above broader interpretation of the statement is therefore one reason for the decline. The share of large enterprises, on the other hand, remained generally unchanged. Compared with smaller businesses, large enterprises are more likely to adopt an explicit strategy and make longer-term plans, and climate action appears to be no exception. Furthermore, regulatory requirements as well as demand from customers and funding providers in the meantime have likely made climate action considerations a fixed element of the business strategy of nearly all large enterprises.

With respect to the shares of energy costs, the decline in the strategic relevance of the issue of climate action is similar in all categories observed. Here the decrease was between 11 and 13 percentage points in all categories of energy cost shares.

Figure 17: Climate action as part of the business strategy by enterprise size over time

Percentage of firms responding *'Applies'* and *'Applies to an extent'*



Note: The question was: 'To what extent does the following statement on the issue of climate action apply to your business: Climate action is incorporated into our business strategy?'

Source: KfW Climate Barometer 2022, 2023, 2024

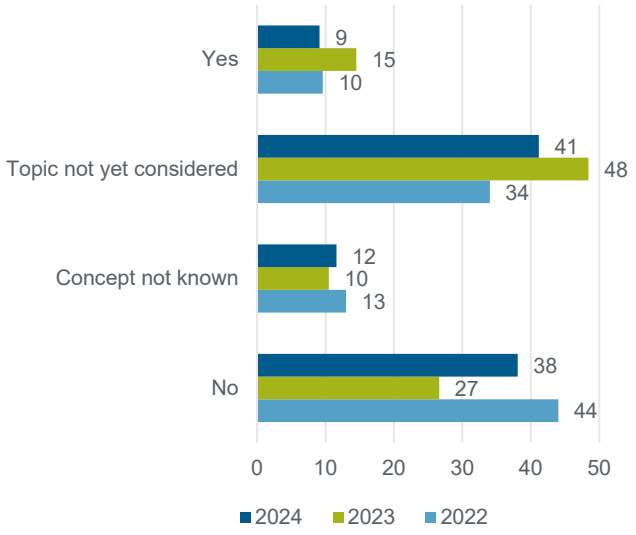
Around 10% of all businesses aspire to become climate neutral – a decline of 6 percentage points

Germany wants to become climate neutral by the year 2045. Incorporating climate action into the business strategy is an important step on the way to this target. At present, however, only few businesses have their own net zero target. Roughly one in ten businesses (9%) responded that they were aiming for net zero (Figure 18), a similar rate as in the year 2022 (10%). However, a sharp decline can be observed compared with the year 2023. That year, one in seven businesses (15%) still reported they were aiming for net zero. This sharp drop is likely due to, among other things, the difficult current economic environment, in which long-

term goals such as climate neutrality become less important.

Figure 18: Climate neutrality as a goal

Share of enterprises in per cent



Note: The question was: 'Are you aspiring for your business to become climate neutral?'

Source: KfW Climate Barometer 2022, 2023, 2024

A comparison by enterprise size class reveals that, with the exception of large enterprises, companies of all other size classes are less likely to aim for net zero than in the previous year. Among large enterprises, however, the share increased from 77 to 80%. The share of small and medium-sized enterprises that aim at climate neutrality is much smaller. Net zero targets were reported by 24% of larger SMEs (-5 percentage points on the previous year). The picture is consistent across the economy, with the share of enterprises reporting that they were aiming for net zero down from the previous year in all sectors. Manufacturing is still the sector with the largest share of enterprises wanting to become climate neutral – 11%. But after 19% in the previous year, it also recorded the steepest decline.

One in four enterprises has a specific plan to reduce emissions; large enterprises are taking the lead

In order to develop a specific climate action strategy, it can be helpful for businesses to come up with specific greenhouse gas reduction plans. Twenty-six per cent of all enterprises agreed at least in part with the statement that they were following a plan specifically aimed at reducing greenhouse gas emissions (Figure 19). That was a 5 percentage-point decrease on the previous year. It was driven primarily by small and medium-sized enterprises.

Large enterprises are trending in the opposite direction. Greenhouse gas reduction plans were put in place at least in part by 93% of them. That was actually slightly more than in the previous year (91%) and may be due to stakeholder demands and reporting requirements described above, which call for specific implementation plans.

Larger businesses, construction and manufacturing firms in particular see climate action as an opportunity to open up new sales markets

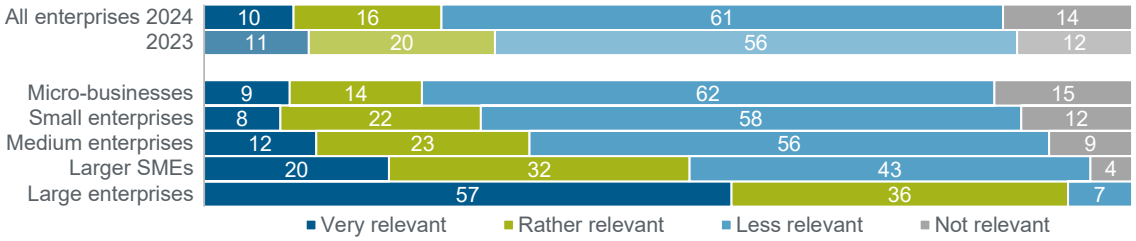
The transformation to net zero, however, not only poses challenges but provides opportunities for tapping into new sales markets. Approx. 15% of enterprises stated that ambitious climate action at national or international level provides them with at least some opportunities to open up new sales markets. That share also dropped to roughly the level of 2022 (16%). In 2023, however, that share was still 19% (Figure 20).

Enterprises from the construction sector are the most optimistic in this regard. Six per cent of enterprises agree fully with the statement that ambitious climate action will open up new sales markets for them, while 15% agree in part. They are followed by manufacturers with shares of 4 and 13%, respectively. The reason companies from these sectors are more likely to see new sales opportunities is probably that they already offer new climate-related technologies or services and therefore would benefit from progress in climate policies.

In this context, the KfW Climate Barometer 2023 revealed that climate action has long established itself as a relevant business factor in Germany. Last year, 30% of enterprises in Germany – around 1.1 million – already offered goods or services that contributed to protecting the climate. The construction sector, which is seen as being particularly relevant for the success of the energy transition in the building sector, recorded the highest share of providers of climate goods, at 52%. The engineering, motor vehicle and electrical industries, which include manufacturers of important climate technologies such as energy-efficient machines, electric vehicles and wind turbines, had a particularly high share of 41% of businesses with climate-friendly goods in their product portfolio.[37]

Figure 19: Greenhouse gas reduction plans

Share of enterprises in per cent

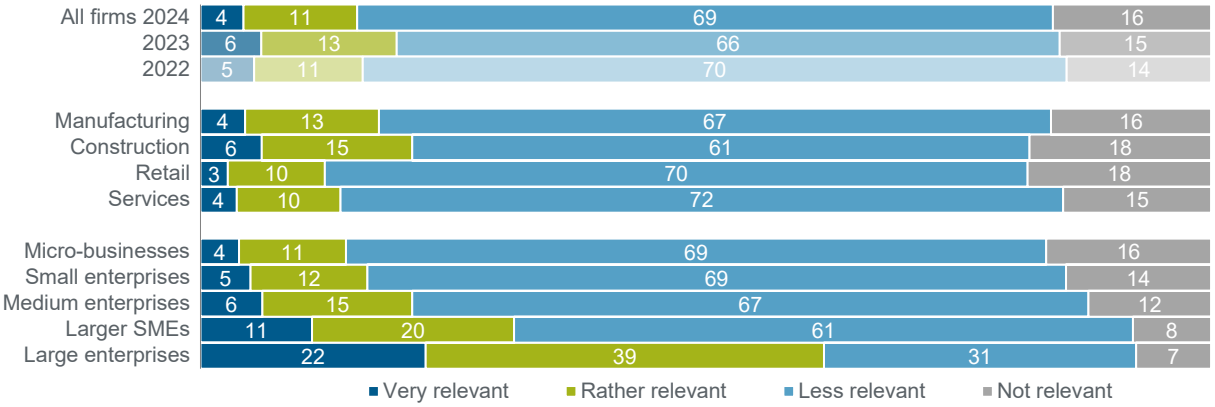


Note: The question was: 'To what extent does the following statement on the issue of climate action apply to your business: Our company has a specific plan to reduce greenhouse gas emissions?'.

Source: KfW Climate Barometer 2022, 2022, 2024

Figure 20: Climate action as opportunity to open up new sales markets

Share of firms in per cent

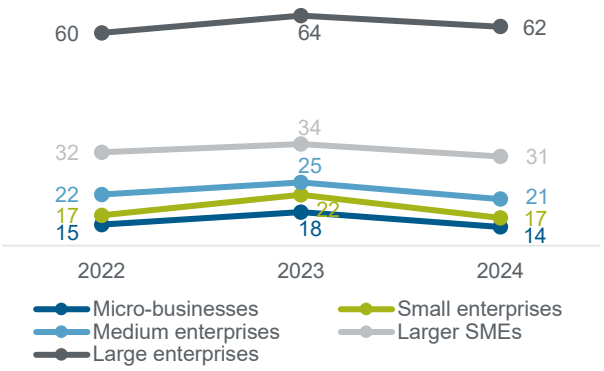


Note: The question was: 'To what extent does the following statement on the issue of climate action apply to your business? Ambitious climate action opens up new opportunities for our business'.

Source: KfW Climate Barometer 2022, 2023, 2024

Figure 21: Climate action as opportunity for new sales markets – share of businesses by size over time

Share of busiesses responding *'Applies'* and *'Applies to an extent'*



Note: The question was: 'To what extent does the following statement on the issue of climate action currently apply to your business? Ambitious climate action opens up new opportunities for our business.'

Source: KfW Climate Barometer 2022, 2023, 2024

The differentiated analysis by enterprises size also reveals significant differences in the way companies assess new sales opportunities. While 15% of micro-businesses see opportunities for new sales markets at least in part, that figure rises to 31% for larger SMEs and even 61% for large enterprises. Figure 21 shows that businesses of all size classes are slightly more pessimistic about their opportunities for tapping into new sales markets than in the previous year. This finding again likely reflects the currently difficult economic environment.

Conclusion

The transformation to climate neutrality requires extensive investments in all economic sectors. Aggregate climate investments by enterprises in Germany have continued to rise – from EUR 75 billion in 2022 to EUR 85 billion in 2023. Adjusted for inflation, that was an increase of a good 5%. Another positive is that climate action as an area of investment has continued to gain in importance. Whereas in 2021 only 12.8% of

all business investment went into climate solutions, that figure rose to 16.1% already in 2022 and 17.1% in 2023. However, when we compare this with the estimated need for around EUR 120 billion on average in private sector investment each year to achieve climate neutrality in Germany by the middle of the century, it also shows that investment efforts must increase even beyond that in the future.

The breakdown by enterprise size classes shows that the increase in climate investment in the past year was driven by large enterprises. In the SME sector, on the other hand, the persistent phase of economic weakness has clearly slowed climate investment activity, which fell broadly by 10% on an inflation-adjusted basis last year. The main barriers to investment were the generally higher price level, rising financing costs and weak economic performance in Germany and around the world. Large enterprises appeared to be able to handle the challenging economic environment better and continued to expand their climate investment activity (+19% in real terms).

This finding underscores the fact that SMEs respond much more sensitively to phases of economic weakness, with an immediate adverse impact on their propensity to invest, including in the field of climate action. To be sure, large enterprises, which typically have more financial resources, can bridge phases of economic weakness more easily. However, not only German and European laws but customers, investors, financial institutions and the general public also demand a higher contribution to climate action from large enterprises, which gives climate investment greater strategic importance for this group of enterprises. Against this backdrop it is safe to assume that they push ahead with planned climate action projects even in economically difficult times in order to future-proof their own business models.

The KfW Climate Barometer also demonstrates that besides economic factors, a range of structural obstacles weigh on businesses' willingness to invest in climate action. The main barrier reported by enterprises is uncertainty around the cost-effectiveness of climate investments. Insufficient financial resources constitute the second barrier, closely followed by lengthy planning and approval procedures. This needs to be addressed in order to incentivise significantly more climate investment in the business sector.

An important tool for this is a reliable and predictably rising carbon price signal so that the costs of fossil technologies reflect the cost of climate damage and, accordingly, make climate-friendly technologies more cost-effective. The lack of financial resources for implementing climate projects underscores how important it is to provide an adequate financing and support framework, including subsidies, reduced-interest loans or risk assumption, for the use of novel climate technologies. This applies in particular in the current environment of higher interest rates. Furthermore, expanding suitable offers of financing instruments that boost equity (e.g. equity capital, mezzanine financing) and funding alternatives that preserve equity (e.g. leasing) can help enterprises meet the upcoming financing needs. Not only do processes need to be streamlined in order to speed up approval procedures but the approval authorities themselves also need to have more staff and better technical equipment. Furthermore, switching to climate-friendly alternatives often requires the availability of sufficient energy and transport infrastructure. This includes, for example, electricity grids, heating and hydrogen networks and the necessary charging infrastructure for electromobility. State regulations need to point the way forward to secure the necessary infrastructure expansion and its financing.

So long as important EU trading partners continue to have a significantly lower level of climate ambition, effective protection from competitive disadvantages is also needed to ensure the acceptance of the green transformation, particularly for energy-intensive businesses competing internationally. The Carbon Border Adjustment Mechanism (CBAM) adopted by the EU and the instrument of climate protection agreements introduced by Germany, which aim to offset additional costs of climate-friendly production processes compared with conventional fossil-based processes, go in this direction. Furthermore, a Europe-wide solution is needed to offset competitive disadvantages of German and European enterprises exporting to third countries when the free allocation of carbon certificates gradually expires under the EU Emissions Trading System from 2026. So far, the EU Carbon Border Adjustment Mechanism addresses only imports into the EU.

At present, however, only few businesses in Germany have their own net zero target (9%). But many businesses continue to have climate action on their agenda – even in economically difficult times. Half of them (51%) have taken climate action into account in their business strategy. The sharp drop on the previous year (-12 percentage points) is mainly attributable to micro-businesses and small enterprises. As the general public, these smaller firms need to be made aware of the necessity of the transformation and the opportunities it brings.

Box 5: Dataset of the KfW Climate Barometer 2024

Business investment in climate solutions is of high relevance for achieving Germany's national climate targets. The **KfW Climate Barometer**, a survey that was conducted for the first time in 2022 and is now available in its third wave, is the first and thus far only representative database for the investment behaviour of all German enterprises in the field of climate action on the road to climate neutrality. It comprises small and medium-sized enterprises as well as large enterprises, thereby mapping the **entire business landscape**. The surveys carried out under the KfW Climate Barometer form the basis for analyses on investments and attitudes concerning the implementation of the energy transition and climate neutrality. Accordingly, the barometer provides a representative picture of the current situation, needs and plans of the businesses.

The established survey instrument of the **KfW SME Panel** forms the starting point. It has been conducted since 2003 as a recurring survey of small and medium-sized enterprises in Germany with annual turnover of up to EUR 500 million – including micro-businesses and sole traders. With a database of up to 15,000 companies a year, the KfW SME Panel is the only representative survey of the German SME sector, making it the most important source of data on issues relevant to the SME sector (you will find more detailed information online at www.kfw-mittelstandspanel.de). A total of 9,556 SMEs took part in the current wave.

In order to obtain a comprehensive picture of the investment behaviour of all enterprises in the field of climate action, the KfW Climate Barometer also includes **large enterprises** with an annual turnover of more than EUR 500 million. This segment, which comprises around 1,800 enterprises in Germany, is also surveyed since 2022. Large enterprises and SMEs are largely asked the same questions, for example regarding their attitudes about climate neutrality and climate action, investments in climate solutions, funding of climate investments, barriers to implementation and energy costs. Overall, 106 large enterprises participated in the survey in 2024.

The **basic population** surveyed for the KfW Climate Barometer comprises all SMEs in Germany. They include private-sector companies from all industries. Excluded are the public sector, banks (central banks and credit institutions) and non-profit organisations. The sample is designed in such a way that it can generate representative and reliable data. In order to be able to draw conclusions on the basic population based on the sample, the results of the survey are weighted or extrapolated (net sample in relation to the basic population). The results are therefore **representative**.[38] The data of the KfW Climate Barometer is also available to external researchers for use in guest visits to KfW Research.

The 2024 survey wave was conducted by GfK GmbH on behalf of KfW Group. The survey period ran from 12 February 2024 to 21 June 2024.

Further information can be obtained at www.kfw.de/klimabarometer.

Supplementary information on the investment volumes employed for climate solutions

For methodological reasons, the volumes invested in climate solutions by large enterprises were not extrapolated directly from the survey data, unlike for SMEs. Rather, the corresponding value results from the product of gross fixed capital formation calculated for large enterprises – based on the national accounts of the Federal Statistical Office[39] – and the share of climate investments in total investments reported by large enterprises under the survey. Thus, the reported volume of climate investments made by large enterprises depends on the gross fixed capital formation reported in the national accounts. As a result of the regular revisions of the national accounts, the investment volumes reported for large enterprises can therefore retroactively change from previously reported values. This report is based on the gross fixed capital formation shown in the national accounts as of August 2024.

Supplementary information about the business sector in Germany

In 2023 there were 3.84 million businesses in Germany. Approx. 3.1 million businesses are domiciled in the western German states (82%), while 690,000 (18%) are located in eastern Germany. In this report, the SME sector covers all enterprises in Germany with an annual turnover of not more than EUR 500 million. According

to this definition, SMEs account for 99.95% of all enterprises in Germany. Some 1,800 businesses are defined as large enterprises with an annual turnover exceeding EUR 500 million.

The vast majority of SMEs in Germany is very small. Eighty-one per cent of businesses have fewer than five employees. That share has grown by around two percentage points since the turn of the millennium. A further 9% of enterprises have 5 to 9 employees. That means nine out of 10 enterprises in Germany have fewer than 10 employees. Only 2% of enterprises have more than 50 employees. The fragmented nature of the business sector is reflected in the average employee headcount. In 2023 the average number of employees was around 10.6 workers per business. In the SME sector (i.e. without large enterprises), the average number of employees including owner-managers was approx. 10.5 (median value 3). The greater fragmentation was primarily due to increasing tertiarisation.

Accordingly, economic activity is strongly shaped by services businesses. Around 77% of all enterprises operate in service industries, including retail and wholesale. This comprises nearly 3 million businesses. With a share of just over 5%, manufacturing has a comparatively low share in the number of businesses, but it provides employment to 16% of all workers. With around 24 employees, its average workforce is also significantly larger than in services businesses (around 10 employees) or the construction sector (approx. seven workers).

[1] Cf. World Meteorological Organization – WMO (2023): Global temperatures set to reach new records in next five years, press release dated 17 May 2023.

[2] Cf. Deutscher Wetterdienst (official German weather service), Extreme Weather Congress in Hamburg (2024): Was wir 2024 über das Extremwetter in Deutschland wissen (*What we know about the extreme weather in Germany* – our title translation, in German).

[3] Caesar, L., Sakschewski, B., Andersen, L. S., Beringer, T., Braun, J., Dennis, D., Gerten, D., Heilemann, A., Kaiser, J., Kitzmann, N. H., Loriani, S., Lucht, W., Ludescher, J., Martin, M., Mathesius, S., Paolucci, A., te Wierik, S. and Rockström, J. (2024): Planetary Health Check Report 2024, Potsdam Institute for Climate Impact Research.

[4] Cf. German Federal Environment Agency (UBA) (2024): Greenhouse gas emissions in Germany (in German) | German Federal Environment Agency, retrieved on 30 September 2024.

[5] Cf. Brand, S., Römer, D. and Schwartz, M. (2021): Investing EUR 5 trillion to reach climate neutrality – a surmountable challenge, Focus on Economics No. 350, KfW Research.

[6] Cf. Brüggemann, A. (2023): Natural gas as a bridge to climate neutrality in Germany – a reassessment, Focus on Economics No. 442, KfW Research.

[7] Cf. Schwartz, M., and Gerstenberger, J. (2024):KfW SME Panel 2024: German SMEs are not immune to the economic slowdown, KfW Research.

[8] Cf. Deutsche Bundesbank (2024): Monthly Report – July 2024, 76th year, No. 7.

[9] Large enterprises were not a target group of this survey.

[10] Cf. Grewenig, E. and Schwartz, M. (2024), Aktuelles Kostenniveau für die meisten Unternehmen tragbar – weitere Kostensteigerungen im Jahresablauf absehbar (Current cost level manageable for most enterprises – further cost increases foreseeable in the course of the year, in German only), Focus on Economics No. 465, KfW Research.

[11] Cf. Abel-Koch, J., Brüggemann, A., Köhler-Geib, F., Kohn, K., Lo, V., Schwartz, M. and Schwarz, M. (2022): KfW Climate Barometer 2022, In 2021, German enterprises invested around EUR 55 billion in climate action – still too little to reach climate neutrality, KfW Research. For further details on the link between external stakeholder demands and implementation of operational climate measures, see also: Grewenig, E. (2024): Anforderungen von Kunden und Finanzierungspartnern gehen mit stärkerem Klimaschutzbeitrag von Unternehmen einher (Demands from customers and financing partners go hand-in-hand with more powerful contributions to climate action from businesses – in German only), Focus on Economics No. 456, KfW Research.

[12] Gross fixed capital formation in the corporate sector comprises private sector investment in machinery and equipment plus construction (without residential construction). Total business investment is calculated by KfW Research on the basis of data from the Federal Statistical Office by adjusting gross fixed capital formation for investment by the state and in residential construction. The underlying data was obtained from Fachserie 18, Reihe 1.4 of the Federal Statistical Office.

[13] A 2021 study commissioned by KfW Research has put the climate action investment needed to achieve climate neutrality in Germany by the middle of the century at EUR 5 trillion. If the necessary climate action investment is spread out over the years remaining until the target year, EUR 190 billion will need to be invested on average each year. A large portion of this investment, around 90% in total, must come from the private sector. Businesses, in turn, traditionally account for roughly 70% of private sector investment. That means enterprises must make roughly EUR 120 billion in climate-positive investments on average each year. If we use this as a benchmark, there was an investment shortfall of at least EUR 35 billion for the business sector for the year 2023.

[14] Cf. Benayad, A., Burchardt, J., Chau, V., Dany, O., Noßmann, A., Ploetz, J., Schroeren, D., Suess, E., Köhler-Geib, F., Kohn, K., Römer, D. and von Kapherr, A. (2023): The Climate Financing Roadmap. How Development Finance Institutions Can Build Bridges to Unlock Private Capital. Boston Consulting Group and KfW.

[15] We additionally calculated a confidence interval of 95% for large enterprises' climate investments for the 2024 reporting year. The corresponding interval ranges from EUR 46 billion to EUR 54 billion. For details on how large we calculated the volume of enterprises' climate action investment, see box on methodology at the end of the report. Plausibility considerations underpin the value determined by the KfW Climate Barometer: For example, if we were to assume, as an approximate solution, that the 56% share represented by large enterprises in the total investment undertaken by the entire business community could be applied one-to-one to the subsegment of climate action investments, large enterprises would contribute approx. EUR 44 billion. One reason why the value determined under the KfW Climate Barometer is now (slightly) higher is that in 2023, significantly more large enterprises chose to make climate investments than was the case in the SME sector (Figure 4). Consequently, large enterprises expanded their investment volumes. For details on the overall investment activity of small and medium-sized enterprises as well as large enterprises, cf. Schwartz, M., and Gerstenberger, J., (2024), KfW SME Panel 2024: German SMEs are not immune to the economic slowdown, KfW Research.

[16] For more on total investment activity by SMEs, cf. Schwartz, M., and Gerstenberger, J. (2024):KfW SME Panel 2024: German SMEs are not immune to the economic slowdown, KfW Research.

[17] Cf. Schwartz, M., and Gerstenberger, J. (2024): KfW SME Panel 2024: German SMEs are not immune to the economic slowdown, KfW Research.

[18] Cf. Grewenig, E., Römer, D. and Rode, J. (2024): Jeder fünfte Pkw im Unternehmensfuhrpark fährt inzwischen elektrisch – weitere Impulse nötig (One in five cars in the company fleet are now electric – further impetus needed – in German only) Focus on Economics No. 470, KfW Research.

[19] Cf. ibid.

[20] The price index for PV modules fell by at least 40% in all module classes between January 2023 and December 2023. Cf. https://www.solarserver.de/photovoltaik-preis-pv-modul-preisindex/ [retrieved on 17 September 2024]

[21] Cf. Schwartz, M., and Gerstenberger, J. (2024): KfW SME Panel 2024: German SMEs are not immune to the economic slowdown, KfW Research.

[22] Cf. ibid.

[23] Cf. Schwartz, M. and Gerstenberger, J. (2024), Zinswende mit überschaubarem Zusatzeffekt auf die Investitionen im Mittelstand (Interest reversal with moderate additional effect on SME investment – in German only), Focus on Economics No. 462, KfW Research.

[24] For an analysis of investment barriers in the SME sector, see also Gerstenberger J., Grewenig E., and Lo, V. (2023): Vielfältige Hemmnisse bremsen Klimaschutzinvestitionen im Mittelstand (A range of barriers slow down climate investment by SMEs – in German only), Focus on Economics No. 440, KfW Research.

[25] It is not possible to make a comparison with the previous year because the current wave of the KfW Climate Barometer surveyed this item for the first time.

[26] Cf. Abel-Koch, J., Brüggemann, A., Köhler-Geib, F., Kohn, K., Lo, V., Schwartz, M. and Schwarz, M. (2022): KfW Climate Barometer 2022. In 2021, German enterprises invested around EUR 55 billion in climate action – still too little to reach climate neutrality, KfW Research.

[27] Cf. Schill, W.-P., Roth, A., Guéret, A. and Schmidt F. (2024): Ampel-Monitor Energiewende: ambitionierte Ziele, aber zu geringe Dynamik (*Traffic-light Coalition Monitor: ambitious targets but not enough momentum* – our title translation, in German), Wirtschaftsdienst, 104(6).

[28] Cf. Müller, M. (2022): Skills shortage marks a turning point: The times of guaranteed growth are over, Focus on Economics No. 414, KfW Research

[29] Cf. Müller, M. (2024): KfW-ifo Skilled Labour Barometer June 2024, Skilled labour shortages differ broadly from sector to sector and regionally, KfW Research. and Peichl, A., Sauer, S. and Wohlrabe, K. (2022): Fachkräftemangel in Deutschland und Europa – Historie, Status quo und was getan werden muss (*Skills shortages in Germany and Europe – history, status quo and what needs to be done* – our title translation, in German), ifo Schnelldienst 75/2022, Munich.

[30] Cf. Grewenig, E. (2023): Mangelnde Digitalkompetenzen erschweren die Rekrutierung von Fachkräften in klimaaffinen Unternehmen (Shortage of digital expertise hampers recruitment of skilled workers in climate-positive businesses – in German only), Economics in Brief No. 240, KfW Research.

[31] Cf .Römer, D. and Salzgeber, J. (2024): KfW Energy Transition Barometer 2024. Energy transition is advancing in households even in an uncertain environment, KfW Research.

[32] Cf. Müller, M. (2024): KfW-ifo Skilled Labour Barometer June 2024, Skilled labour shortages differ broadly from sector to sector and regionally, KfW Research.

[33] Cf. Abel-Koch, J. (2023): KfW-Internationalisation Report 2023. Many SMEs currently perform better than their foreign competitors but see need for action to secure their future competitiveness, KfW Research.

[34] According to the ifo Business Survey of 15 April 2024, the availability of materials in Germany is approaching pre-COVID-19 levels, retrieved on 10 October 2024.

[35] Cf. Grewenig, E. and Schwartz, M. (2023): Weitere Energieeinsparungen für viele kleine Unternehmen aktuell mit Herausforderungen verbunden – bei einem Drittel Energiesparmaßnahmen geplant (Further energy savings currently pose challenges for many small businesses – one third plan energy reduction measures, in German only), Focus on Economics No. 439, KfW Research.

[36] Cf. Schwartz, M., Abel-Koch, J. and Brüggemann, A. (2022): Hohe Energiekosten durch den Krieg in der Ukraine – in der Breite des Mittelstands (noch) tragbar (High energy costs as a result of the war in Ukraine – (still) bearable for most SMEs – in German). Focus on Economics No. 403, KfW Research.

[37] Cf. Grewenig, E. and Brüggemann, A. (2024): Geschäftsmodell Klimaschutz: Bereits 30 % der Unternehmen in Deutschland haben Klimaschutzgüter im Produktportfolio (Climate action as a business model: 30% of enterprises in Germany already have climate-friendly goods in their product portfolio – in German), Focus on Economics No. 458, KfW-Research.

[38] The extrapolation factors are established on the basis of the following four criteria: number of employees, sector, region and KfW support status (only for quantitative indicators). Details on this can be found in the Appendix of Methods to the KfW Climate Barometer 2024 and the previous waves.

[39] Gross fixed capital formation in the business sector comprises private sector investment in machinery and equipment plus construction (without residential construction). The investment volume in the SME sector is surveyed in the context of the KfW SME Panel. Total business investment is calculated by KfW Research on the basis of data from the Federal Statistical Office by adjusting gross fixed capital formation for investment by the state and in residential construction. The underlying data was obtained from Fachserie 18, Reihe 1.4 of the Federal Statistical Office. The investment volume of large enterprises (with an annual turnover of more than EUR 500 million) is determined by subtracting the volume calculated for SMEs from the corresponding value for the entire business sector.