



KfW Research

»»» KfW Climate Barometer 2022

In 2021, German enterprises invested around EUR 55 billion in climate action – still too little to reach climate neutrality

Imprint

Publisher

KfW Group

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Frankfurt / Main, November 2022

In 2021, German enterprises invested around EUR 55 billion in climate action – still too little to reach climate neutrality

KfW Climate Barometer surveys investment in climate action by all businesses in Germany for the first time

The goal of climate neutrality requires extensive investment in all economic sectors. At the same time, the fossil fuel crisis has Germany firmly in its grip. The massive expansion of renewables and the systematic advancement of energy efficiency are therefore not only necessary in terms of climate policy but also an important strategic key to Germany's energy security. The new KfW Climate Barometer is to date the only representative database covering investment behaviour on the road to climate neutrality across the entire business sector in Germany. It is designed as a recurring annual survey and provides insights into the attitudes and activities of businesses around the implementation of the energy transition.

Wide variations in awareness of business challenges

More than half of businesses in Germany (53%) have at least partly anchored the topic of climate action in their own business strategy. However, only one in ten businesses specifically aim to become climate neutral. At the same time, nearly half the businesses are either not familiar with the concept of climate neutrality at all (13%) or have not yet dealt with it (34%).

Majority of businesses believe their business model is compatible with climate neutrality

More than half of enterprises in Germany (55%) believe climate neutrality is compatible with their business model. Even so, one fourth of enterprises concede that their business activity is not or only partly compatible with climate neutrality. This applies particularly to energy-intensive operations.

One in four businesses invested

In 2021, around 870,000 enterprises invested a total of EUR 55 billion in measures that also serve to protect the climate – 23% of all businesses in Germany. That means just one out of every eight euros invested in the business sector in 2021 was allocated to climate action investments. Larger enterprises and manufacturers are more eager to invest, and the amounts they invest are also higher on average. The

investments made were evenly split between SMEs and large enterprises. Businesses invested most frequently in green mobility, followed by measures aimed at making existing buildings energy-efficient and expanding the use of renewables.

To reach climate neutrality, investment needs to grow substantially

In order for Germany to become climate neutral, businesses must invest around EUR 120 billion on average each year up to the year 2045. This is more than twice the level currently being implemented, meaning investment must grow significantly. A look at Germany's greenhouse gas reduction target for the year 2030 highlights the need for this growth, as this target cannot be reached unless the scope of current reductions increases threefold.

Most businesses fund climate action investments from own resources

The lion's share of climate action investments in 2021 was funded from businesses' own resources (71%). Bank loans and promotional funds each made up 12% of the funding mix. Small and medium-sized enterprises were more likely to fund their projects with the aid of bank loans and promotional funds.

Cost-effectiveness is a key aspect of investment decisions

The main factor determining an enterprise's decision for or against climate action investments is cost-effectiveness. A reliable framework and clear financial incentives are therefore the main control lever to enable the upcoming investments to be realised. The lack of financial resources, particularly in smaller and energy-intensive businesses, and the shortage of personnel and qualifications also need to be addressed.

Desire for simpler planning and approval procedures is widespread

What businesses want most from policymakers is to simplify planning and approval procedures. Nearly two thirds of all enterprises see this as important. Slightly more than half of all enterprises regard greater planning certainty around carbon pricing as important.

Ambitious climate action presents challenges and opportunities

The 2022 European summer was the warmest ever recorded. It was characterised by several very strong heatwaves, unusual drought and forest fires in many regions of Europe.¹ The impact of climate change is being increasingly felt in the form of increased extreme weather events in Germany, too.² The economic damage being caused by climate change is already considerable. The cost of damage in Germany is estimated at around EUR 145 billion for the years 2000 to 2021.³ It underscores the need for ambitious action to slow the increase in global temperatures.

Germany and the European Union adopted ambitious greenhouse gas reduction targets under international climate agreements. The transformation laid out in these agreements comes with enormous structural change that poses major challenges for businesses in Germany. But these businesses are also in a good starting position as they compete with environmental and climate-smart goods at international level.⁴ The commitments of many countries to climate neutrality will lead to a significant increase in global demand for low-emissions technologies, generating substantial opportunities for future growth and employment for German businesses.

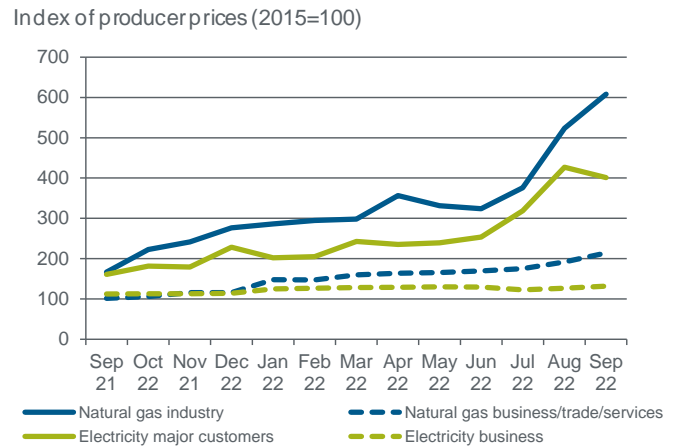
Joining up climate action and energy security

At the same time, Germany is currently in a fossil fuel crisis. The main driver is the loss of piped Russian gas as a result of the war in Ukraine. The associated supply risks have caused prices in the natural gas and electricity markets to soar. Industrial enterprises that procure energy more frequently under short-term trades on the spot markets based on larger offtake quantities, in particular, directly face steep increases in energy costs (Figure 1). This is putting great pressure primarily on energy-intensive businesses and weakening their international competitiveness. Like households, many businesses from the trade, commerce and services sector are still benefiting for the time being from existing contracts with energy suppliers that hedged corresponding quantities during a period of rising market prices. Increasing energy costs typically take some time to filter through as contracts expire or suppliers make subsequent contractual price adjustments.⁵ The great price wave therefore has likely not yet even started to roll in this sector.

Russia’s invasion of Ukraine has also shown how vulnerable Germany is as a result of its high dependence on fossil energy imports. The rapid and

massive expansion of renewables, the ramp-up of a green hydrogen economy and the systematic advancement of energy efficiency are therefore not only necessary in terms of climate policy but an important strategic key to Germany’s energy security and its competitiveness as an industrial location. Climate action and energy security are closely linked to this.

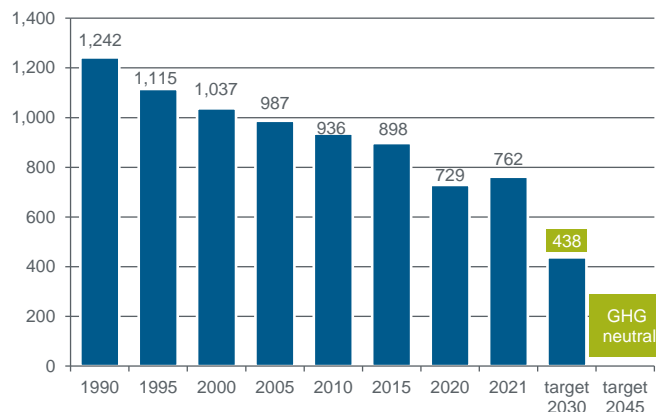
Figure 1: Development of energy prices in Germany



Source: German Federal Statistical Office (2022)

Climate neutrality requires a complete transformation in all economic sectors

Already in June 2021, Germany readjusted the national targets set out in the Federal Climate Change Act after the decision by the EU to raise its greenhouse gas reduction target for 2030 and the decision by the Federal Constitutional Court to protect the interests of future generations. Specifically, Germany aims to reduce its greenhouse gas (GHG) emissions by 65% compared with the 1990 baseline by the year 2030 (situation in 2021: -38.7%) and become climate neutral by 2045 (Figure 2), five years before the European Union. Achieving climate neutrality means that greenhouse gas emissions must be drastically reduced in all economic sectors in Germany in the next 23 years and unavoidable emissions must be offset using natural sinks (e.g. afforestation) or negative emissions technologies (e.g. carbon capture and underground storage). As a result, the economy as a whole will have to largely get by without fossil fuels such as coal, oil and natural gas by 2045. This requires a complete transformation in all economic sectors and a surge in capital expenditure involving all businesses.

Figure 2: Greenhouse gas emissions in GermanyIn million tonnes of CO₂ equivalent

Source: German Federal Environment Agency (2022)

KfW Climate Barometer gives insights into the activities of German businesses on the road to climate neutrality

In order to be able to provide the best possible support to businesses on their path to climate neutrality, more in-depth information must be obtained about their investment behaviour and climate action needs. This new KfW Climate Barometer provides such insights. It is the first and thus far 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 will be published annually and provide a representative picture of the attitudes and activities of businesses around the implementation of the energy transition. The current survey centres around the strategic anchoring of climate neutrality as a theme within businesses, the scope of climate-positive investments carried out and how they are funded, and barriers as well as success factors for the implementation of climate investments. Around 11,000 businesses took part in the survey, which was conducted between 10 February 2022 and 17 June 2022. Their statements about realised climate-positive investments refer to the year 2021. More details about the structure of the KfW Climate Barometer can be found at the end of this report (Box 7).

Half of all businesses have anchored climate action at least partly in their business strategy

The ambitious national target of climate neutrality underscores the strategic relevance of climate action for businesses of all sizes. Many businesses have recognised decarbonisation as a business challenge. Thus, more than half of businesses in Germany already

regard climate action as strategically relevant (Figure 3). Twenty-five per cent of businesses have mainstreamed the issue into their general business strategy, and this is at least partly the case in 28% of businesses. Conversely, around 40% do not regard climate action as part of their own strategy. The potential for further growth therefore remains significant.

Box 1: Size classes used

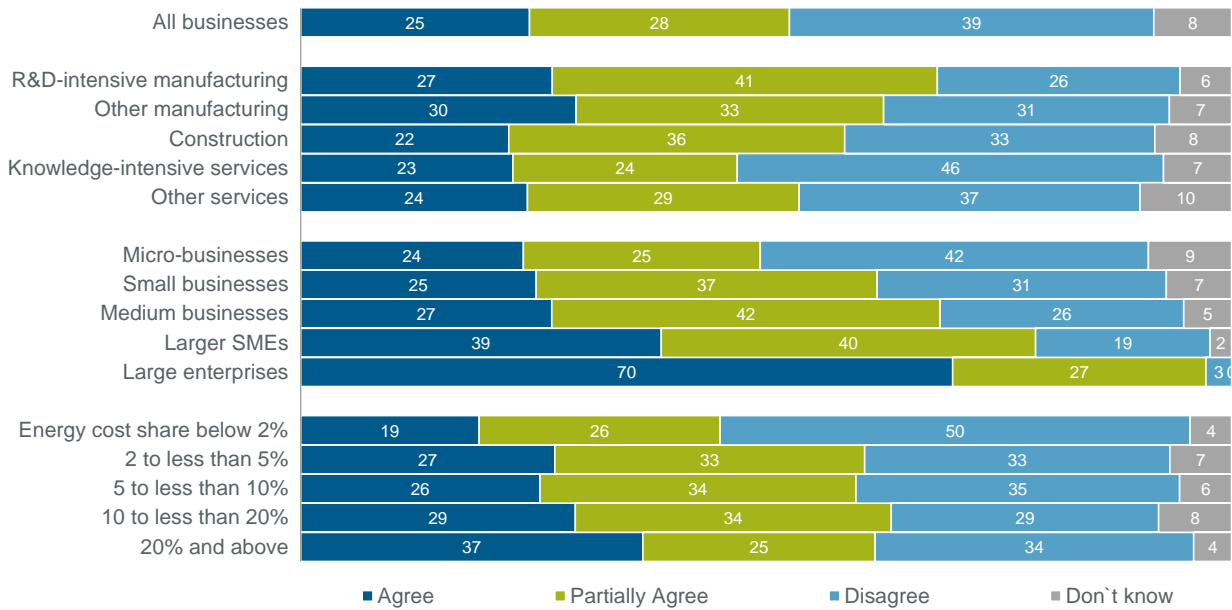
The KfW Climate Barometer divides businesses into five different size classes. These are defined as follows: **Micro-businesses** have fewer than five employees. **Small businesses** have five to nine employees. **Medium businesses** are defined as those that have ten to 49 employees. Companies with 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. Accordingly, **large enterprises** are defined as companies with an annual turnover exceeding EUR 500 million. The number of employees, however, does not play a role. 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). This is primarily the case in comparisons with previous year, which are presented in additional boxes.

The sector comparison shows that climate action plays a strategically relevant role particularly for manufacturing enterprises. This segment harbours many energy-intensive manufacturers such as the paper industry as well as metal production and processing enterprises. The shift away from fossil fuels naturally has great strategic importance for those businesses and affects them directly.

This finding is underscored by the fact that energy-intensive enterprises whose energy costs account for more than 10% of their total cost are much more likely to see climate action as being of strategic relevance for their business. Furthermore, the strategic relevance of the issue of climate action generally also grows with the size of the enterprise. Among the group of larger SMEs, around 40% of enterprises already see climate action as part of their strategy, while that figure is even 70% for large enterprises.

Figure 3: Climate action as part of the business strategy

In per cent



Note: Specifically, 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

Only 10% of all businesses aspire to achieve climate neutrality further ahead

Germany and the EU have adopted the ambitious long-term goal of making business activity climate neutral by 2045 and 2050, respectively. Although 53% of enterprises have incorporated climate action at least partly into their general business strategy, only few are actually pursuing this goal already. Just 10% of all businesses are aspiring to make their business climate neutral, and one third of them have not yet dealt with the issue at all (Figure 4). Around 13% of businesses are not even familiar with the concept of climate neutrality. This group comprises a particularly high number of micro-businesses and small businesses. In pursuing the goal of climate neutrality, larger businesses have taken the lead. Seventeen per cent of larger SMEs and 72% of large enterprises reported aspiring to become climate neutral in the future.

Nonetheless, businesses pursuing climate neutrality have ambitious projects, and some even aspire to go beyond the political targets. Thus, more than half the

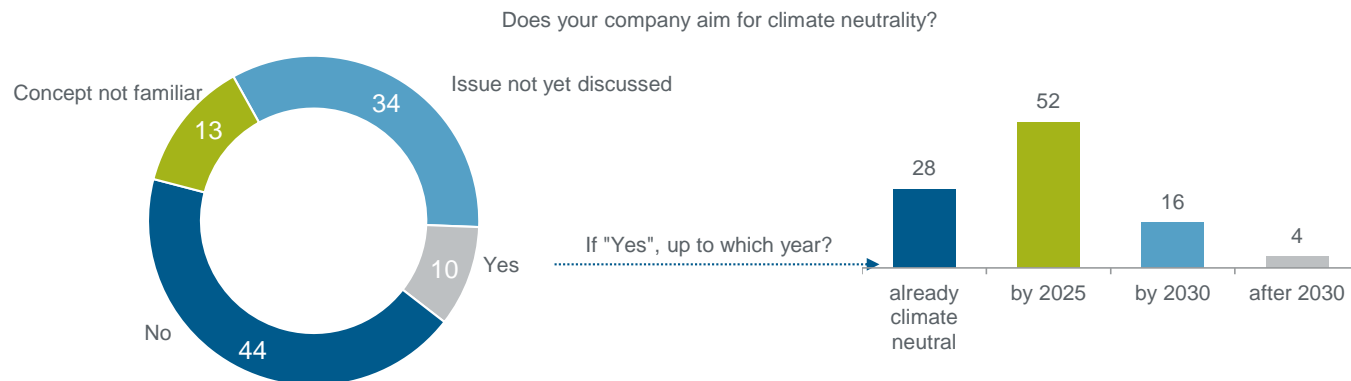
willing businesses aspire to become climate neutral by the year 2025 – 20 and 25 years earlier than the political targets of making the economy climate neutral by mid-century. Nearly 30% of businesses aspiring to become climate neutral even reported having achieved this goal already. This group primarily comprises micro-businesses and small businesses whose processes are not very energy- and emissions-intensive. By contrast, only 5% of large enterprises reported that their operations were already climate neutral.

Business leaders who have greenhouse gas reduction targets and know the carbon footprint of their business are still the exception

In order to develop a concrete climate action strategy and compare it with the political target, it can be helpful for businesses to operationalise it through company-specific greenhouse gas reduction targets. But only a small fraction of businesses in Germany – 13% – has formulated concrete emission reduction targets thus far. And here as well, considerable differences by business size are evident (Figure 5).

Figure 4: Businesses and their climate neutrality target

In per cent



Note: Right: only businesses aspiring to become climate neutral

Source: KfW Climate Barometer 2022

While only up to 18% of small and medium businesses have formulated concrete GHG reduction targets for their own operations, this figure is already 77% for large enterprises.

The business- or product-specific carbon footprint will increasingly gain importance on the road to climate neutrality. If the climate-relevant properties of goods and services are captured in a transparent and plausible manner, businesses can highlight the climate-relevant benefits of their production processes and, in this way, gain competitive advantages. In a regulatory environment increasingly geared to sustainability, it is becoming increasingly important for enterprises of all sizes to have detailed and reliable information documenting what effects their business activity has on the environment and society and, conversely, how climate risks impact on the development of their business. At present, fewer than one in five micro-, small and medium businesses know their own GHG footprint, which is likely to make it difficult for these enterprises to identify emission reduction potentials in their business models. By contrast, 31% of larger SMEs and 83% of large enterprises are already familiar with their own GHG footprint.

Demands from stakeholders are leading to more transparency on emissions and reduction targets

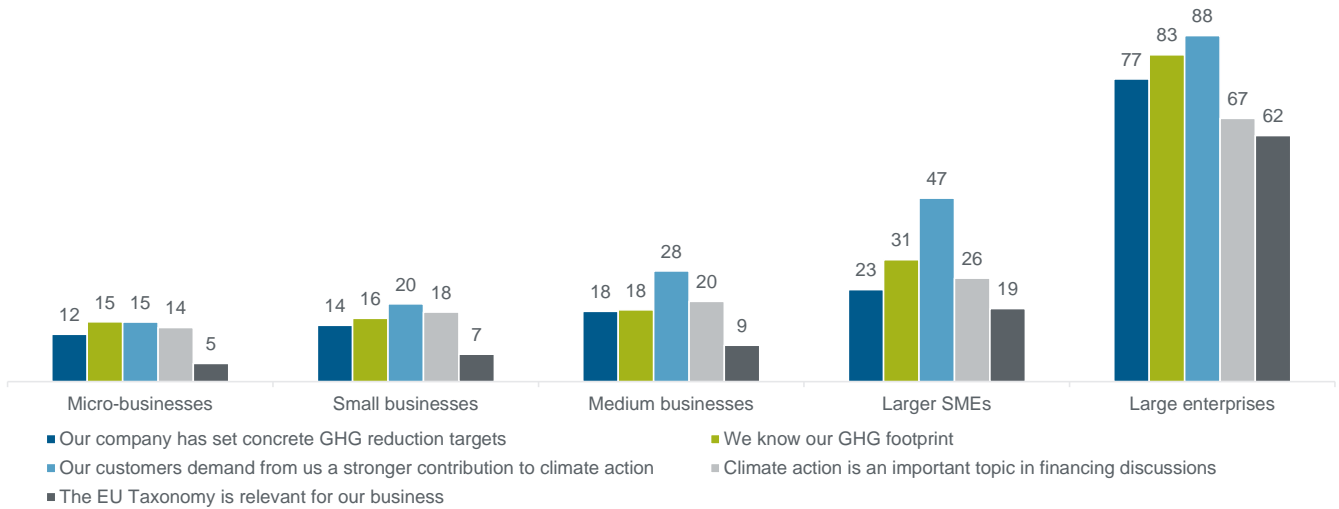
The strategic importance of climate protection generally correlates closely with business size, and this is

probably due primarily to the fact that large enterprises have more human and financial resources to thoroughly address climate action. At the same time, they are subject to more stringent transparency requirements. Large enterprises must comply with specific reporting obligations on environmental and social impacts (e.g. as part of their CSR reporting and the EU Taxonomy Regulation) as well as compulsory energy audits, which are likely to have contributed to increasing the strategic importance of the issue of climate action in these enterprises. Some of them are required to participate in EU emissions trading. That also puts them under greater pressure from stakeholders such as customers or financing partners to act on climate change.

Thus, only around 15% of all businesses believe that their customers demand at least a partial contribution to climate action, or that climate action is an important topic in discussions on finance. Only 5% of businesses reported that the EU Taxonomy Regulation for sustainable activities is relevant for them. However, this average view is heavily based on the high number of small businesses in Germany. Responses from large enterprises revealed that 88% and 67% face such demands from customers or financing partners, respectively (Figure 5). Still, nearly half of larger SMEs reported that their customers were increasingly demanding a contribution to climate action.

Figure 5: Importance of climate action by business size

In per cent



Note: Percentage of businesses that agree or partly agree with the above statements.

Source: KfW Climate Barometer 2022

Across all business size classes, a strong correlation between (perceived) pressure from stakeholders and the degree to which businesses engage with climate action is evident. Enterprises that face pressure from their customers, their financing partners or the regulation are more likely to have incorporated action on climate change into their business strategy, formulated greenhouse gas reduction targets for their business and be familiar with their own GHG footprint (Figure 6).

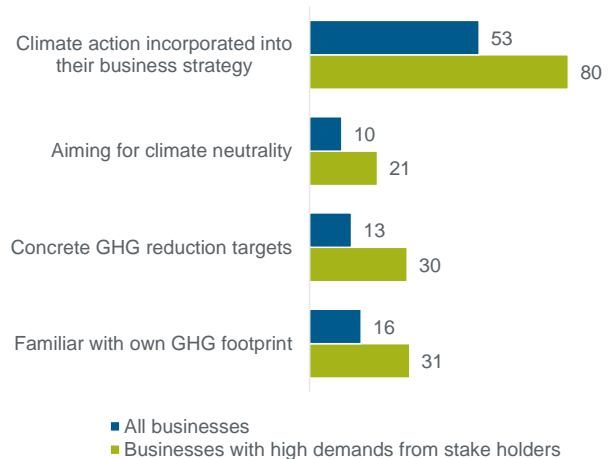
Majority of businesses believe their business model is compatible with climate neutrality

The transformation towards climate neutrality can open up a wide range of opportunities for businesses, but it can also present challenges. If the commitments of the Paris Climate Agreement are implemented and addressed with corresponding policy initiatives, demand for climate-friendly products, production processes and infrastructures will likely grow around the world. That will open up a wide range of opportunities for established and new businesses to tap into new markets. But climate neutrality also means that in the future, entrepreneurial success will require greenhouse gas-neutral processes. Greenhouse gas-intensive enterprises, in particular, will need to modify their business models, which may involve high investment and pose challenges to competitiveness. More than half of enterprises in Germany (55%) believe that the political target of climate neutrality is compatible with their business model (Figure 7). This applies especially to large enterprises. By contrast, 25% of businesses conceded that their operations were not or only partly compatible with the concept of climate neutrality. This

is especially true of medium businesses and larger SMEs. Nevertheless, the fact that a mere 8% of businesses regard their business model as entirely incompatible with the climate targets can be seen as positive for the transformation.

Figure 6: Correlation between engagement of businesses and demands from stakeholders

In per cent



Note: Percentage of businesses to which the above statements on climate action apply at least in part. Demands from stakeholders are high when the business agrees or partly agrees with at least one of the following statements: 'Our customers demand from us a stronger contribution to climate action', 'Climate action is an important topic in financing discussions', 'The EU Taxonomy is relevant for our business'.

Source: KfW Climate Barometer 2022

Mixed assessment of opportunities and risks across the various sectors

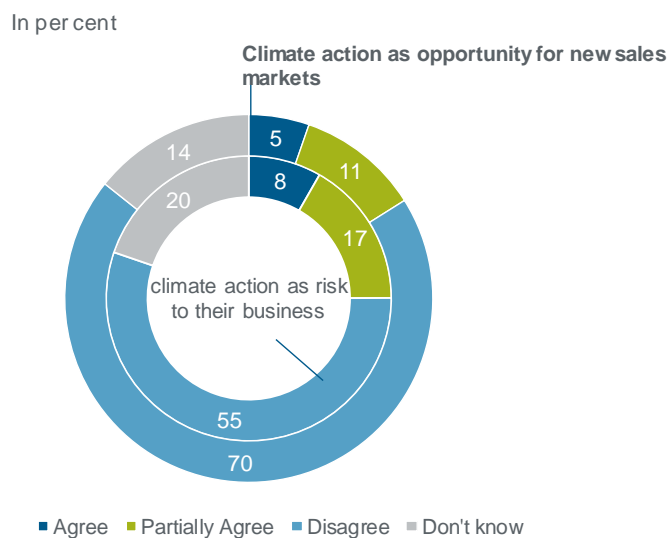
A sectoral comparison shows that enterprises in the subsegment of other manufacturing⁶ in particular, which include companies from the food industry and manufacturers of metal goods, for example, regard ambitious climate action as a risk to their business. Up to 36% of businesses in these industries believe that climate neutrality is at least partly incompatible with their business model. One way of explaining this might be that this business sector comprises a large number of energy-intensive enterprises where energy supplies are still mainly based on fossil fuels. In these businesses, the target of climate neutrality often requires a fundamental conversion of production processes and substantial investment. Besides, the green transformation of energy-intensive industries needs large additional quantities of electricity from renewables as well as climate-neutral hydrogen. The infrastructure needed for this is only just being created.

Services business, on the other hand, only rarely see climate neutrality as a threat to their business model. A mere 6% of knowledge-intensive and 10% of other service providers believe that ambitious climate action is incompatible with their business model. Interestingly, only 8% of R&D-intensive manufacturing enterprises⁷ believe that climate neutrality might threaten their business model. This subsegment of manufacturing also includes automotive engineering, for example. At first, one would expect that existing enterprises would see themselves facing major challenges from the mobility transition. The value added in the manufacture of a vehicle changes in the shift to electric mobility. Auto-makers and suppliers will have to adapt accordingly in the coming years to ensure that they remain competitive. Despite this, the majority of enterprises in this segment do not appear to perceive the transformation as a threat to their own business model.

If German businesses succeed in providing technological solutions for achieving the ambitious global emission reduction targets, that can increase value added, employment and prosperity in Germany while making a substantial contribution to climate action around the world. However, many enterprises generally appear to be sceptical as to whether ambitious climate

action opens up opportunities for them to tap into new national and international sales markets (Figure 7). Only 5% of businesses expect this, while a further 11% believe this to be the case for them at least in part. Opportunities for opening up new sales markets through climate action are expected primarily by large enterprises (21%), while only around 5% of micro-businesses and small businesses agree.

Figure 7: Business opportunities and challenges through ambitious climate action



Note: The specific questions were: To what extent do the following statements apply to your business: 'Ambitious climate action opens up new sales markets for our business', and 'Climate neutrality is not compatible with our existing business model'.

Source: KfW Climate Barometer 2022.

One of the reasons for this is likely the fact that only around one fifth of SMEs in Germany generate international turnover.⁸ In the German business community, R&D-intensive manufacturers have the highest degree of internationalisation. That segment also has the largest proportion of enterprises that see climate action as offering at least some opportunity for new sales markets (34%). Furthermore, many key technologies for achieving climate neutrality are still at the demonstration or prototype phase (e.g. large-scale electrolysis of green hydrogen, new generation of batteries) and must be introduced to the market, resulting in new opportunities for the future of R&D-intensive enterprises in particular.

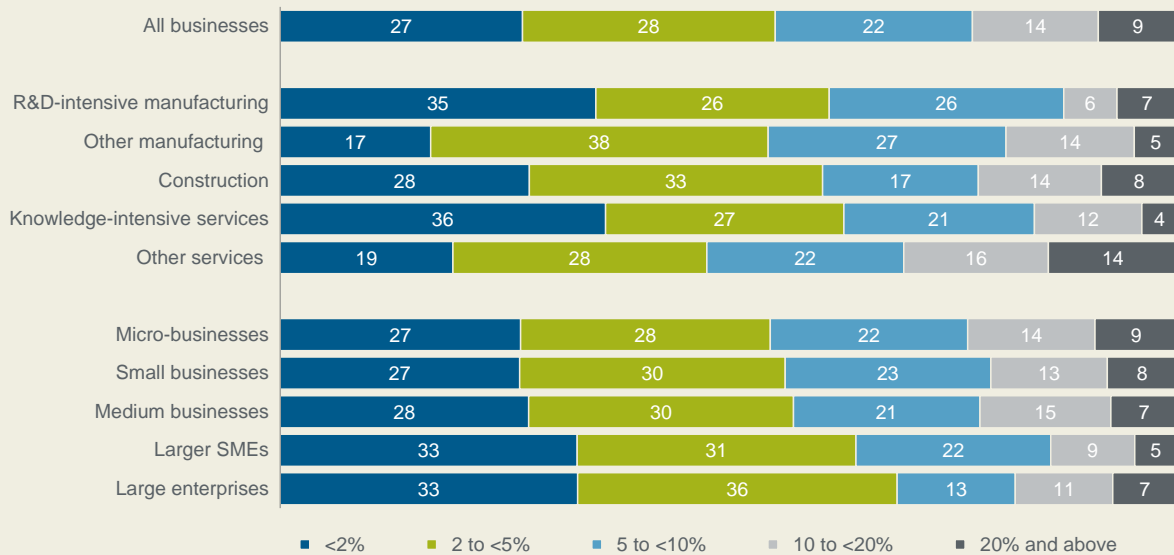
Box 2: Enterprise energy cost shares

Businesses are affected to different degrees by the increase in energy costs. For one thing, the business landscape shows a mixed distribution of energy costs in overall costs (see figure). For another, these costs also differ in absolute terms.

In 2021, before the outbreak of the war in Ukraine and the energy crisis, energy costs made up less than 5% of total costs in more than half of all businesses (55%). The share of energy costs was 20% or more in only around 9% of businesses. What is striking is that other manufacturing tends to have higher energy cost shares than R&D-intensive manufacturing. A major reason for this is likely the fact that other manufacturing comprises many energy-intensive industries such as paper and glass manufacturing and the production of metal goods. In R&D-intensive manufacturing, by contrast, mechanical and automotive engineering play an important quantitative role, and they are deemed less energy-intensive. Also worth highlighting is the fact that the segment of other services has the highest share of businesses – 14% – whose energy costs exceed 20%. These businesses include retailers and wholesalers, hospitality and accommodation, where heating and air conditioning of business premises and the refrigeration of food, among other measures, are likely to pay a decisive role for energy costs.

Share of energy costs in total costs of businesses in 2021

In per cent



Note: The specific question was: ‘How high was the share of energy costs in total costs incurred by your business in 2021?’

Source: KfW Climate Barometer 2022

At structural level, the overall corporate landscape is strongly shaped by the high number of small businesses. However, the energy cost share does not also necessarily rise with the size of the business. Whereas energy costs accounted for less than 5% of the total costs of around 55% of micro-businesses in 2021, that also applied to 64% of larger SMEs.

Nearly one in four enterprises made climate-positive investments in 2021

To what extent did businesses carry out climate-positive investments last year? The findings of the KfW Climate Barometer illustrate that almost one in four (23%) of the nearly 3.8 million enterprises in Germany – around 870,000 businesses – made climate-positive investments in 2021 (Figure 8). Climate-positive investments are defined as investments in measures aimed at avoiding or mitigating greenhouse gas emissions from the relevant business in which action on climate change does not necessarily have to be the top priority. These include, for example, investments to conserve energy or increase energy efficiency, measures that involve the use of renewable energy, and investments in climate-friendly transport such as the acquisition of electric vehicles. Another 7% or approx. 266,000 enterprises made no such investments in 2021 but plan to do so by the end of the current year 2022. That means well over one million businesses – almost one in three enterprises in Germany – now have climate-

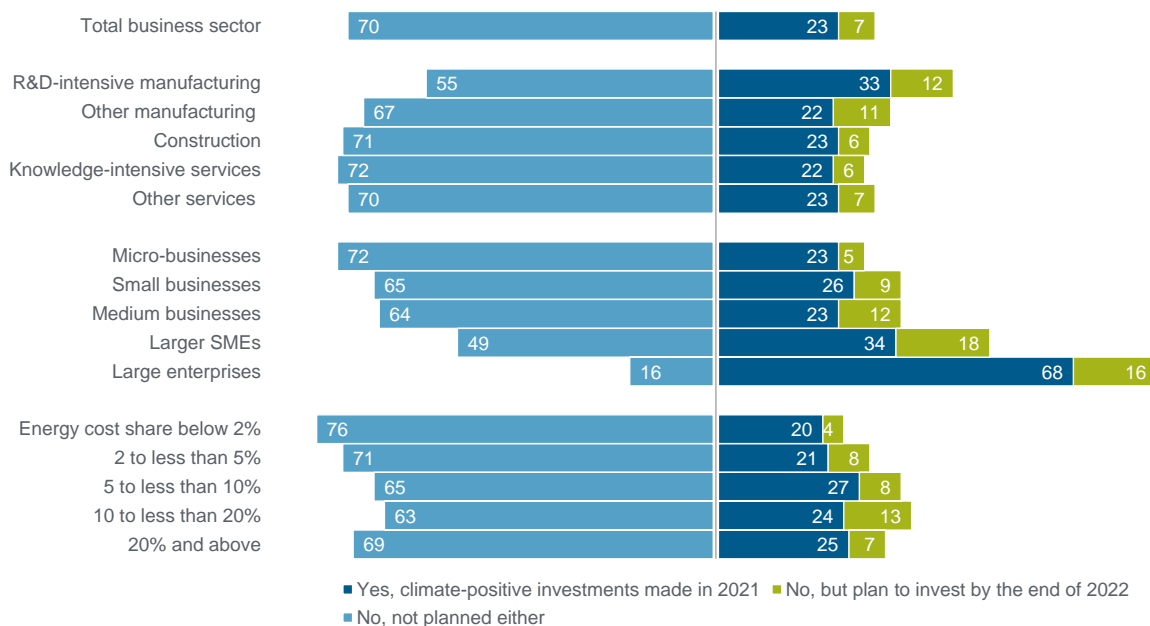
positive investments on their agenda.

The investment projects with climate relevance that have already been realised are particularly size-dependent. The frequency of climate investment projects also increases with the size of the enterprise. Large enterprises exhibit by far the strongest propensity to invest. More than two thirds of them made climate-positive investments in the year 2021, and a further 16% plan to do so by the end of 2022.

Conversely, however, this also means that 70% of companies did not complete any investment projects with a focus on climate action in the same year nor plan to do so before the end of the current year. That means the potential for further investment in climate action is considerable. To qualify this point, however, it must be added that businesses have generally been rather reluctant to invest for some time now. In 2021, 62% of all businesses did not invest at all.⁹

Figure 8: Climate-positive investments undertaken by businesses in Germany

In per cent



Note: The specific question was ‘Did your company invest in climate action in Germany in the year 2021?’ It was also pointed out that investments in climate action mean 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 takes into account the fact that businesses often do not consider climate action aspects in greater detail until they have to make replacement investments.

Energy cost share means the share in total costs incurred by the business.

Source: KfW Climate Barometer 2022

What must also be considered is that climate-positive investments may have been given less priority during the course of the pandemic. It is conceivable that funds earmarked for investments were primarily channelled into investment projects more strongly directed at maintaining or adapting business operations (for example, modifications to the product or service offering). In any case, it would have been plausible for companies to divert or direct budget funds away from climate action investments.¹⁰ The uncertainties from the current energy crisis are likely to have made businesses reluctant to invest this year as well. A more in-depth analysis of the barriers to the implementation of climate-positive investments is presented later on in this report.

Strong investment participation from manufacturers

In implementing climate investments, the segment with the strongest participation is R&D-intensive manufacturing (33%), which comprises many of the larger SMEs and large enterprises. All other segments reflect roughly the same level of investment appetite as the business sector overall. The investment appetite of the two services segments is a positive sign for the participation of the business sector as a whole, as they represent the large subsegments of knowledge-intensive services and other services, which comprise around 3 million businesses in Germany alone.

Large enterprises and manufacturers are more heavily engaged, partly because these segments are traditionally more willing to invest overall. Besides, manufacturing includes a large number of energy-intensive industries whose production and working processes are significantly more energy-intensive compared with the services sector, which gives them greater incentives to invest in energy efficiency, for example.

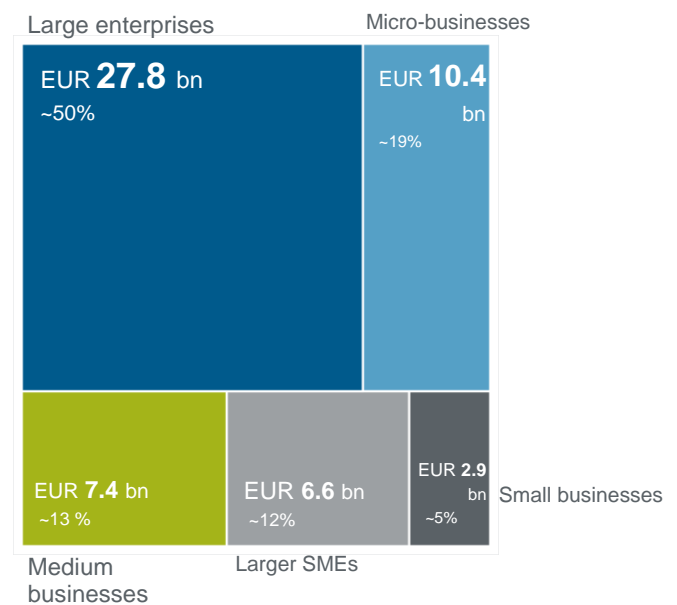
In 2021, German enterprises invested a total of EUR 55 billion in climate action

The KfW Climate Barometer now makes it possible for the first time to put a figure on the climate investments undertaken across the business landscape. Thus, in 2021 enterprises invested a total of around EUR 55 billion in projects that also serve to protect the climate. As total gross fixed capital formation in the business sector¹¹ amounted to EUR 433 billion last year, that means around one in eight euros (12.7%) was dedicated to this area. Approx. half of this – EUR 27.8 billion – was invested by large enterprises (Figure 9), which allocated around 12% of their total new

investment of EUR 250 billion to climate action measures in the year 2021.¹² Micro-businesses occupied the second position. They currently account for around 19% of total climate action investments by businesses in Germany. But given that they represent 82% of all enterprises in Germany, this is obviously still relatively low. Nonetheless, micro-businesses already invest almost one in four euros on average in climate-related projects.

Figure 9: Distribution of climate action investments by business size class in 2021

Volume per size class and share in total volume of climate action investment



Source: KfW Climate Barometer 2022

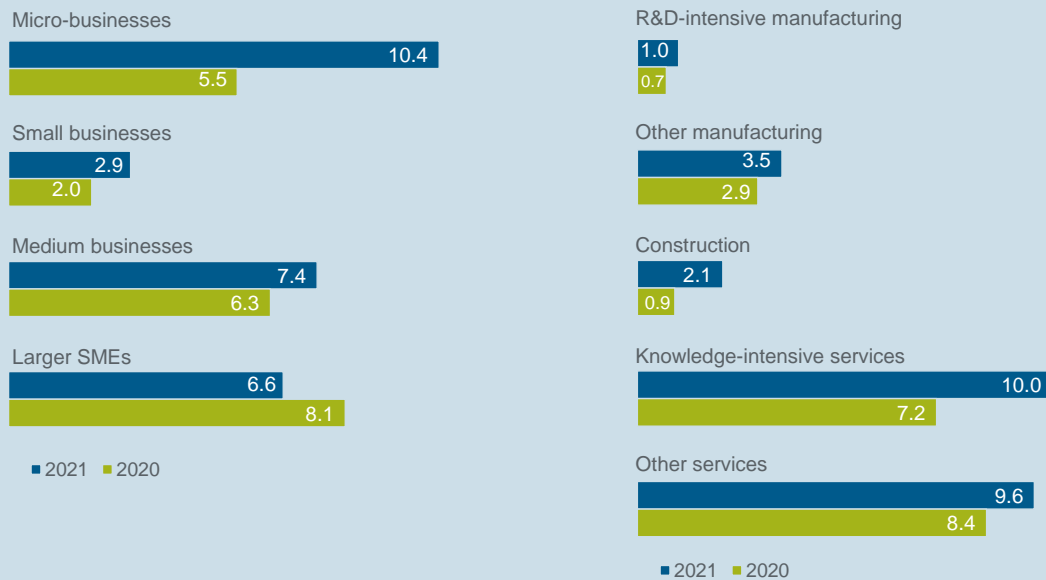
A study commissioned by KfW Research has put the climate action investment needed to achieve climate neutrality in Germany by the middle of the century at EUR 5 trillion.¹³ If the necessary investment is spread out over the years remaining until the target year, EUR 190 billion will need to be invested on average each year. A large portion of this, around 90% in total, must come from the private sector.¹⁴ Businesses, in turn, traditionally account for roughly 70% of private sector investment. That means enterprises must undertake roughly EUR 120 billion in climate-friendly investments on average each year. On that basis, the level of ambition of the business sector will need to more than double in the coming years in order to realise the investments required on the road to climate neutrality.

Box 3: Development of climate investment in the SME sector in 2021 compared with 2020

While large enterprises' climate investments were surveyed in 2022 for the first time for the year 2021, SMEs' climate investments were also surveyed for the year 2020 as part of the KfW SME Panel 2021. That makes it possible to compare SMEs' investments with those of the previous year.

Climate investments in the SME sector by segments in 2020 and 2021

Volume in EUR billions



Sources: KfW Climate Barometer 2022; Schwartz, M., Abel-Koch, J. and Brüggemann, A. (2021), [Investing in the future and competitiveness: German SMEs invest EUR 22 billion in climate action](#), Focus on Economics No. 359, KfW Research.

Measured by the proportion of businesses making investments in the SME sector, there has been an increase from around 12% to now 23%. That represents a massive increase of +380,000 investing enterprises in the year 2021. Investments by micro-businesses in particular increased on the previous year. Here, the share of businesses undertaking investments more than doubled from 10% to 23% in 2021. That means this size class represents the lion's share of newly added investors. The willingness to invest in projects related to climate action grew very strongly in the segment of other services (from 9% in 2020 to now 23%). These businesses include retailers and wholesalers as well as personal services, catering and hospitality, broad sections of the tourism industry, nursing care, training and education as well as arts, culture and sports. Whereas in the previous year these businesses still exhibited a clearly below-average willingness to invest – in line with their business model –, that trend has now reversed completely. The impact of the coronavirus crisis may have put the brakes on this segment, especially in the first year of the pandemic. What is also likely to have encouraged more activity in 2021 was last year's low interest rate level as well as attractive promotional terms, particularly for energy-efficient building retrofit and the acquisition of electric vehicles.

The considerably larger numbers of investing SMEs in 2021 have also led to a higher investment volume. Climate investments grew by 24% or EUR 5.3 billion to EUR 27.3 billion year on year (2020: EUR 22 billion). That currently puts the share of climate investment in all new investment by SMEs (EUR 183 billion) at 15%. Furthermore, all subsegments surveyed have increased the volume of their climate investments. Knowledge-intensive services were most prominent, with + EUR 2.8 billion (+39%). The highest relative change was recorded by R&D-intensive manufacturing enterprises (42%, or + EUR 0.3 billion). Micro-businesses stood out from all the size classes. They saw their investment volume surge by +88% or + EUR 4.9 billion to EUR 10.4 billion.¹⁵

Almost half of all businesses invested in climate-friendly mobility

Businesses that made climate-related investments did so primarily by taking action in the field of climate-friendly mobility (Figure 10). Almost half of those making investments (47%) implemented such projects, for example by acquiring an electric vehicle or charging infrastructure.

Around one third (32%) invested in improving the energy efficiency of existing buildings, for example by installing heat insulation or heat pumps.

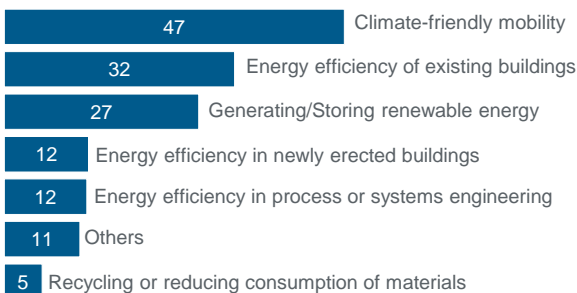
Measures aimed at generating or storing electricity or heat from renewables ranked third, with 27% of investing firms taking action in this field. Energy efficiency measures in newly erected buildings and improvements to energy efficiency in process or systems engineering (e.g. production, cooling) followed at some distance, with 12% of businesses investing in each area.

Investments in recycling or reducing the consumption of materials were relatively uncommon, and were made by only around 5% of all investing businesses.

One reason for the high share of investments in mobility is probably because (almost) every business maintains at least one company car, while energy-efficient process or systems engineering, for example, is of relevance only for manufacturers, which are less numerous.

Figure 10: Frequency of climate investments made by businesses

In per cent of investors, multiple responses possible.



Source: KfW Climate Barometer 2022

Small projects dominate climate investments

The vast majority of businesses that invested in climate action in 2021 allocated rather moderate amounts to their projects (Figure 11). The average sum invested by micro-businesses, which represent the bulk of investing enterprises, was EUR 23,000. Half the businesses in this size class of smallest enterprises, however, invested less than EUR 18,000 (median). The distribution of sums invested is therefore uneven, with a large number of businesses investing rather small sums and comparatively fewer enterprises spending very high amounts on climate-related projects. This pattern is evident in all the segments of the business sector shown, albeit on different levels.

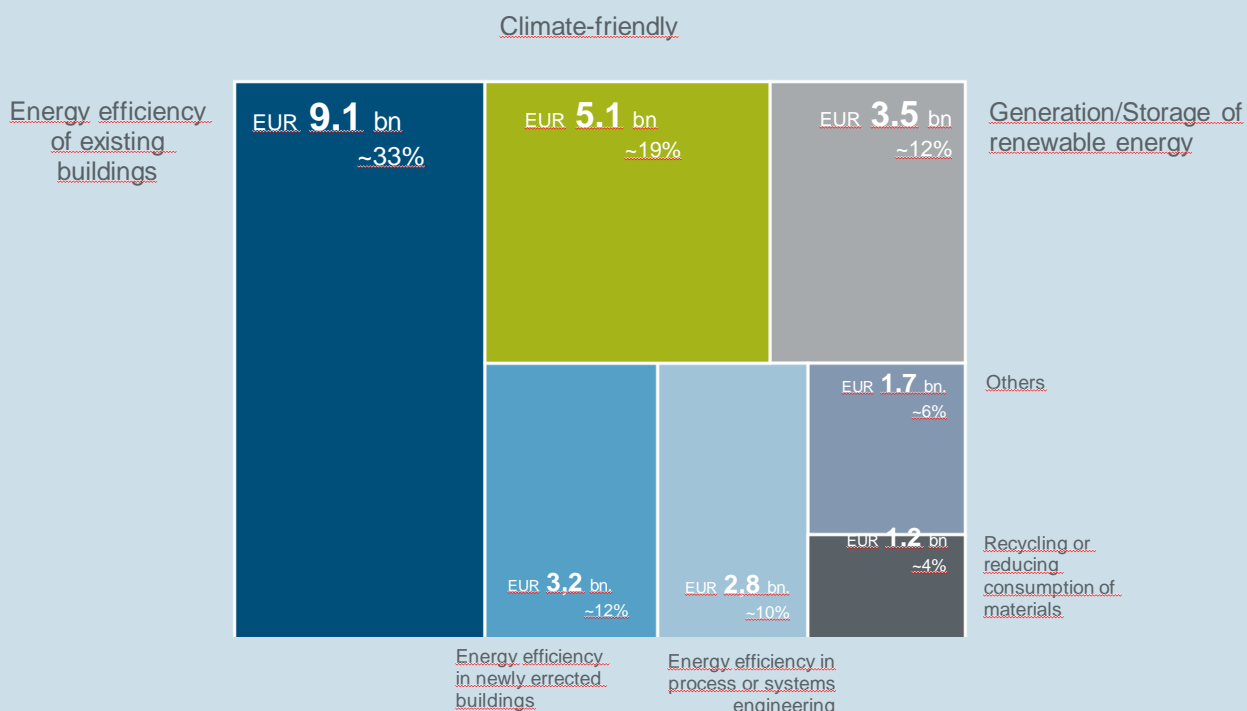
The amounts which businesses allocate to climate action investments grow significantly with the size of the enterprise. Thus, on average, large SMEs invest roughly 11 times more in their projects than micro-businesses (EUR 251,000 compared with EUR 23,000). In a sector comparison, which is limited to SMEs, however, manufacturers stand out again. Average investment volumes are significantly higher both in R&D-intensive manufacturing SMEs and in other manufacturing firms than in other sectors.

The fact that climate investments of larger enterprises and manufacturers are not just more frequent but have higher average amounts is likely due to the more frequent implementation of capital-intensive measures. Earlier studies by KfW Research showed that these segments are significantly more likely to conduct substantial measures aimed at improving energy efficiency and reducing energy costs.¹⁶ These include, for example, investments in energy-efficient production facilities or in improving the energy efficiency of business premises. By contrast, the smaller the business, the more likely it is to focus on measures that can be implemented rather quickly and cost-effectively – also because of budget restrictions –, such as the replacement of an old, inefficient heating system or the acquisition of an electric vehicle.

Box 4: Distribution of SMEs' climate investments by area

The volume of investments allocated by SMEs to individual areas can be estimated. While climate-friendly mobility clearly tops the list 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 12.4 billion in 2021, which was nearly half the sum of climate investment by SMEs (EUR 27.3 billion). Investments in existing buildings alone represented EUR 9.1 billion, the highest share. For comparison: SMEs invested a total of around EUR 5.1 billion in climate-friendly mobility. A further EUR 3.5 billion was invested in the generation or storage of electricity or heat from renewable energies. Unfortunately, not enough data is available about large enterprises to be able to identify the corresponding differences in investment volumes.¹⁷

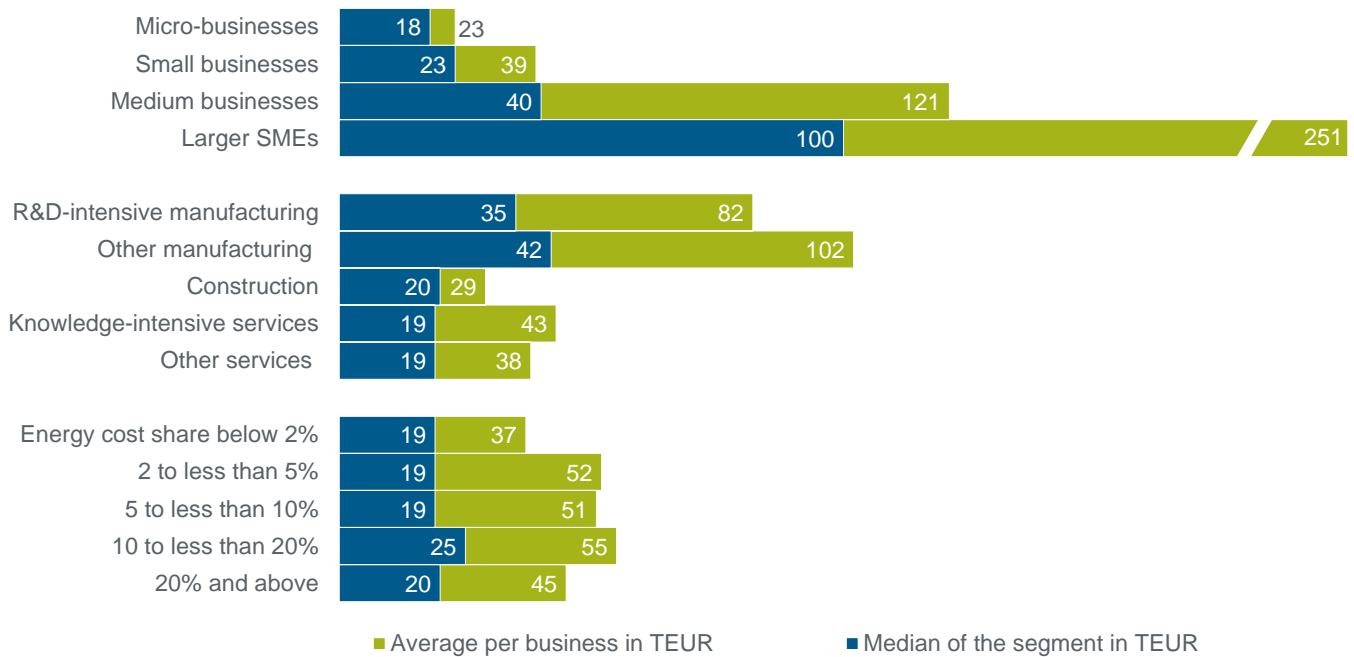
Investment volumes and shares allocated to climate action by SMEs per target area



Source: KfW Climate Barometer 2022

Figure 11: Average volumes invested in climate action projects by SMEs

In EUR thousands; the calculation includes only businesses that actually implemented investments with a climate focus in the year 2021



Note: Energy cost share means the share in total costs incurred by the business.

Source: KfW Climate Barometer 2022

Box 5: Average amounts invested by SMEs are on the decline

The average volume of SMEs' investments can be compared to that of the previous year. The average amount of climate-related investments decreased by around 39% between 2020 and 2021 – from EUR 72,000 in 2020 to EUR 44,000 in 2021. Still, businesses that invested in climate-positive measures are anything but anti-investment. On the contrary: In general terms, those that completed climate investments are clearly disproportionately active investors.¹⁸ What this trend reflects is the high investment propensity of micro-businesses and other service providers in 2021, whose investment volumes are lower on average. Average volumes of climate-related investments decreased year-on-year in all SME segments. The declines range from relatively low percentages in construction (-12%) and knowledge-intensive services¹⁹ (-12%) to a drop of -58% in other services.

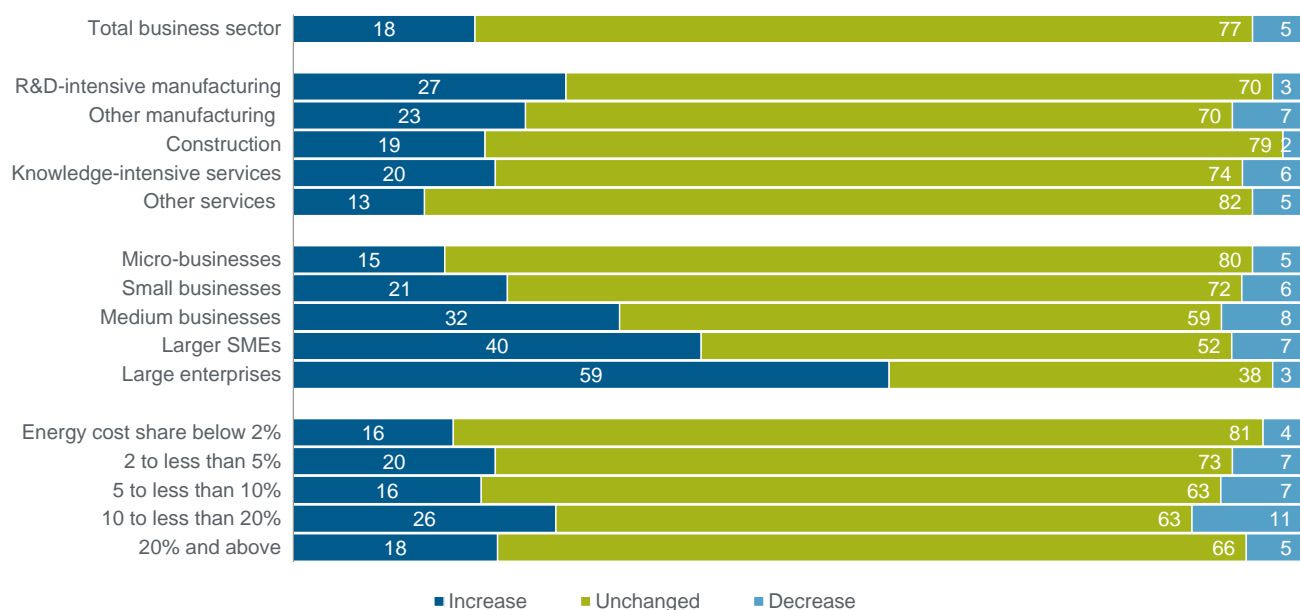
Climate investments will likely remain on a high level in 2022 – amid high uncertainty

The volume of investments for climate-positive purposes can be expected to rise this year. The estimates made by businesses on the development of their climate investment volumes in 2022 point in this direction.

Of the businesses that already implemented such projects last year, 18% want to expand their investments in the current year 2022 (Figure 12). Large enterprises top the list here, with 59% even planning to invest higher amounts. Half of these businesses plan to raise their investment volume by at least 25% on the previous year, and one in ten even expect to double the volume they invested in 2021. More than three fourths (77%) of all businesses that already made climate investments in 2021 expect to invest the same volume in the current year 2022. Only 5% plan to limit their investment activity, although at the time of the survey, half of these businesses predicted a decline of at least 80%. This is likely due in part to the fact that most businesses invest not so much on a continuous basis but sporadically.

Figure 12: Expected development of climate investments in 2022 compared with 2021

In per cent, only enterprises with climate investments in the year 2021



Note: The specific question was: 'How will your company's climate investments develop in 2022 compared with the previous year?'

Source: KfW Climate Barometer 2022

It remains to be seen, however, what effect the war in Ukraine and the energy crisis will have on investment appetite in general and climate investments in particular in the current year 2022. Already in early May 2022, it was at least apparent that rising energy prices had prompted many businesses to adopt measures aimed at reducing energy consumption or using renewables.²⁰ In the first four months of this year, around 20% of enterprises either invested in electric mobility or entered into a long-term offtake agreement for electricity from renewables. Around 10% of businesses invested either in generating electricity and heat from renewables themselves or in improving the energy efficiency of their own operations. The current energy crisis could provide this subsegment of climate investments an additional boost.

Conversely, the high uncertainty in the business sector is also causing many businesses to postpone or abandon investments altogether in the current year. In the SME sector alone, more businesses will have revised their investment plans during 2022 than ever before. At the beginning of September 2022, only just over half of SMEs – 52% – reported that they were implementing all investment projects as initially planned this year, a sad all-time high by a wide margin. Investments initially planned worth EUR 59 billion alone will presumably be lost due to these downward revisions this year.²¹ At the same time, a weak economy and a less positive development of turnover are reducing the

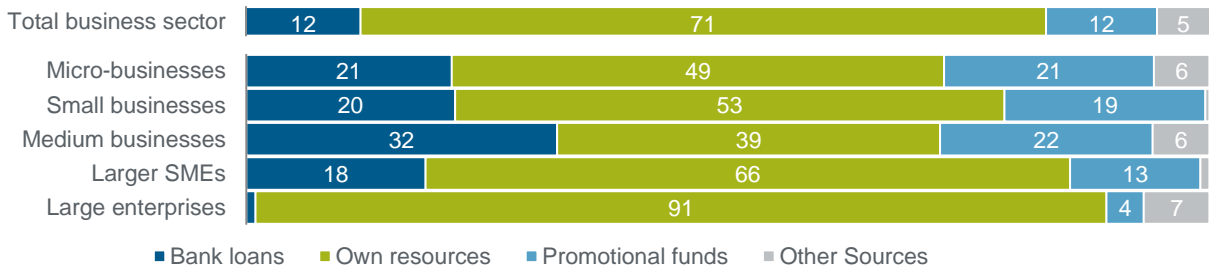
available budget for investments. What effect the continuing high inflation will have on investments is also difficult to predict. On the one hand, where planned investments are implemented as planned, rising prices are pushing investment volumes up in nominal terms. On the other hand, the foreseeable interest rate hikes to combat inflation will tend to adversely impact on the financeability and payback periods of investments.

Businesses funded climate action investments mostly from own resources

Businesses funded the lion's share of climate investments (71% of volume) from their own resources, i.e. cashflow and reserves (Figure 13). The funding volume was approx. EUR 39 billion. The volume of loans received from banks and savings banks (including current-account loans and overdraft facilities), on the other hand, was much lower at around EUR 7 billion, or 12% of the funding mix. Around 139,000 enterprises took up bank loans to finance their climate-related investment projects last year. Promotional loans also amounted to around 12% of the funding volume – approx. EUR 6 billion. Bank loans and promotional funds thus represented 24% of the funding volume. Around EUR 3 billion – roughly 5% – came from other sources. They comprised, among others, publicly traded capital market instruments such as bonds and shares as well as over-the-counter equity such as venture capital or private equity.

Figure 13: Funding of climate investments

Percentage of investment volume



Note: 'Other sources' include, among others, publicly traded capital market instruments such as bonds and shares as well as over-the-counter equity such as venture capital or private equity.

Source: KfW Climate Barometer 2022

Large enterprises used own resources almost exclusively, while small and medium businesses were more likely to use promotional funds

Debt played almost no role in the financing of climate investments of large enterprises (Figure 13). Bank loans were much more important for medium businesses (32%). As the volume used for climate investments was generally rather moderate (median in 2021: EUR 19,000, based only on SMEs), the relatively small importance of debt capital is plausible. Measured against the often low financing volumes, applying for a loan is simply too much of an effort for businesses, and the processing costs are too high for banks. In many cases the need for external funding is also likely to be rather low.

With 4% of the funding volume, public promotional funds also hardly played a role for large enterprises. By comparison, businesses in the smaller size classes used promotional funds to finance roughly one fifth of their climate investments.

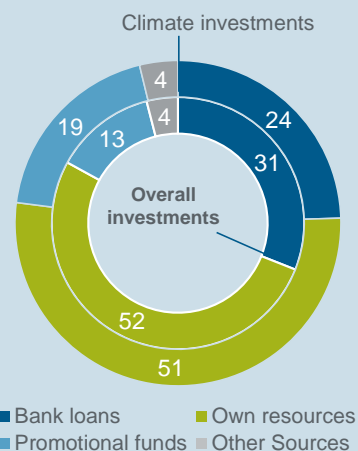
While debt capital carried more weight for small businesses than large enterprises, the opposite was the case for own funds. Large enterprises allocated 91% of the funds needed for their climate investments from their own resources. That amounted to approx. EUR 25 billion or almost two thirds of the volume of own funds used in the business sector as a whole.²² By contrast, the share of own funds used by micro-businesses was 'only' 49% or around EUR 5 billion.

Box 6: Few differences to traditional investment finance in the SME sector

The available data allows individual funding instruments to be compared with traditional investment finance for relevance to SMEs. What is interesting here is that SMEs are less likely to use debt capital for climate investments and instead use more promotional funds than in general investment finance. For one thing, this is likely to be an expression of the wide range of public promotional programmes. For another, owing to the smaller amounts allocated to climate action projects (average of EUR 44,000 and a median of EUR 19,000), arranging debt capital for climate investments involves relatively more effort compared with general investment finance (average of EUR 170,000 and a median of EUR 28,000).

Comparison of funding mix in climate investments vs. overall investments by SMEs in 2021

Percentage of funding volume



Sources: KfW Climate Barometer 2022, KfW SME Panel 2022

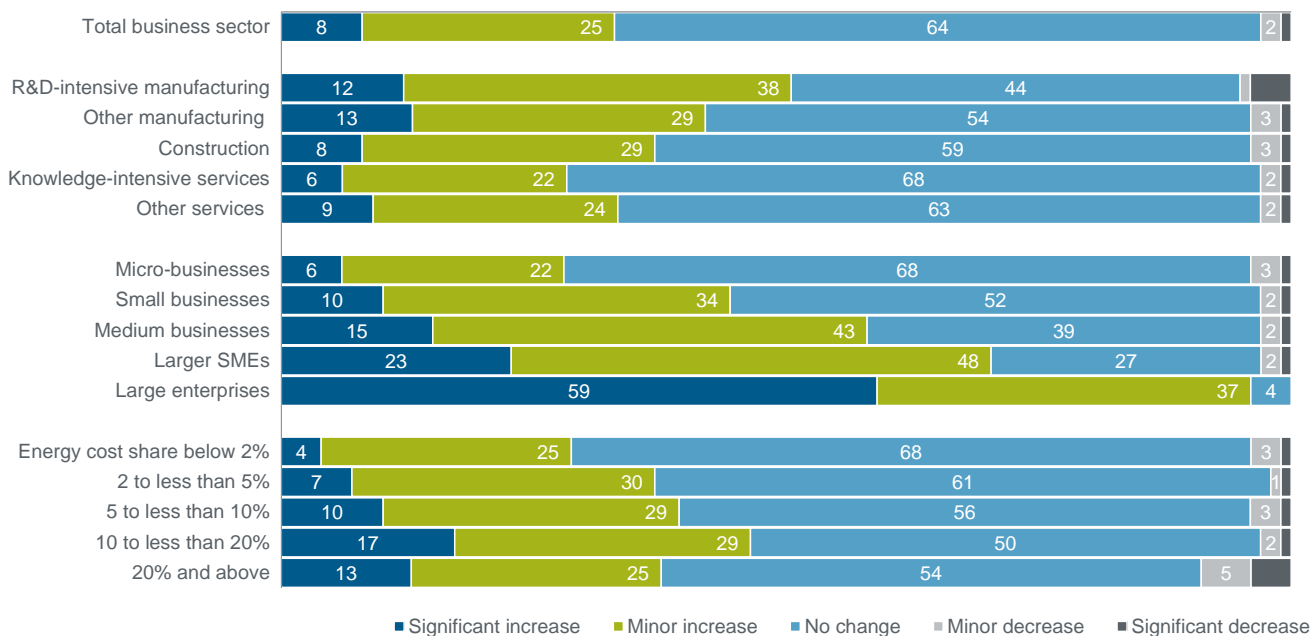
Climate action is becoming more important in investment decisions

There is little doubt that climate investments will continue to gain importance from a business perspective (Figure 14). Eight per cent of businesses in Germany plan to significantly expand their climate investments in the next three to five years, and a further 25% of businesses expect at least a minor increase. Only a very small proportion of 3% anticipate a reduction over that period.

The longer-term outlook also shows the familiar pattern. A disproportionately high share of large enterprises expect their engagement to increase in the future. In addition, more manufacturers are planning to expand their investments than service providers. What is true for the planned short-term investment activity during the current year also applies to longer-term planning, namely that the energy crisis has the potential to influence plans either way. In other words, climate investment could receive an additional boost or hit a roadblock as a result of the great uncertainty.

Figure 14: Expected development of climate investments in the next three to five years

In per cent



Note: Energy cost share means the share in total costs incurred by the business.

Source: KfW Climate Barometer 2022

Cutting energy costs is the main driver for climate investments

With regard to the motivations for investing in climate solutions, it is apparent that cutting energy costs was the top priority. Two thirds of businesses that invested in climate action in 2021 mentioned this motive (Figure 15). This finding reflects the economic interests of businesses and is consistent with findings from the KfW Energy Transition Barometer, which is representative of all households. Economic aspects play the biggest role in investment decisions by households as well.²³ Both study findings confirm that the only way for climate action to become established in the necessary breadth without regulatory requirements is by coupling it with economic benefits. A stable political framework that provides economic incentives for the use of climate-friendly investments is therefore the best foundation for the necessary future investments. In particular, a reliable and projectably rising CO₂ price signal that internalises the costs of climate damage from the use of fossil fuels in the cost calculations of the parties who cause the damage is an essential factor for success, so that over the long term, climate-friendly technologies can be more cost-effective than fossil alternatives that damage the climate.

The second most common motive of businesses that have already made climate action investments is the desire to make an own contribution to climate action (55%). Complying with legal requirements follows at quite a distance (36%). Having access to public promotional funds was a reason to invest in climate action for around one in four businesses (22%). Around one in six investing businesses (16%) mentioned customer demands as a motive. Tapping into new sales markets and avoiding reputational risks currently plays a rather minor role across the business community (6% each).

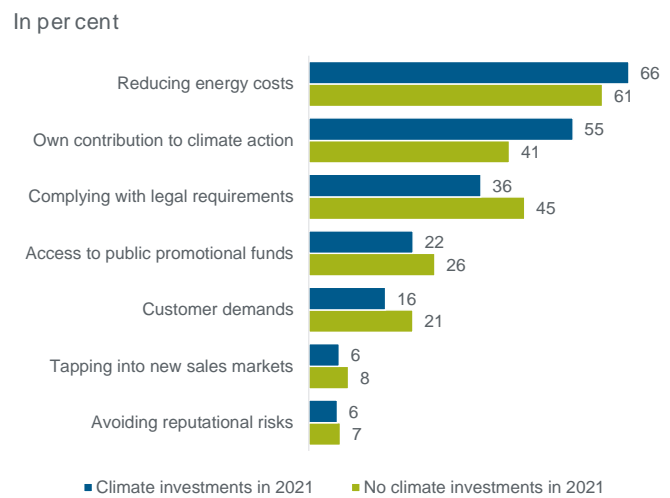
Passive businesses have similar motives

Businesses that made no climate investments last year were similarly asked what aspects would prompt them to invest in climate action. They exhibited a similar pattern but were more likely to refer to external stimuli. Thus, they mentioned legal requirements (45%), public support schemes (26%) and customer demands (21%) more often than investing businesses. Individual benefits such as reducing energy costs (61%) or contributing to climate action (41%) were mentioned less often. This generally suggests a more passive

attitude to climate action that places less focus on the possible potentials. It reflects the previously described finding that approx. 40% of businesses believe climate action is not of strategic relevance to them.

The comparison of the various sectors shows a rather homogeneous landscape with only minor differences in priorities. For example, reducing energy costs is more important to manufacturers (70%) than service providers (61%). Also, contributing to climate action is a more important motive for manufacturers (53%) than for service providers (43%). The other aspects are mentioned with similar frequency and with no systematic trends.

Figure 15: Motives for businesses to invest in climate action



Note: The specific question was: 'What were or would be important motives for your business to make climate investments?' Multiple responses were possible.

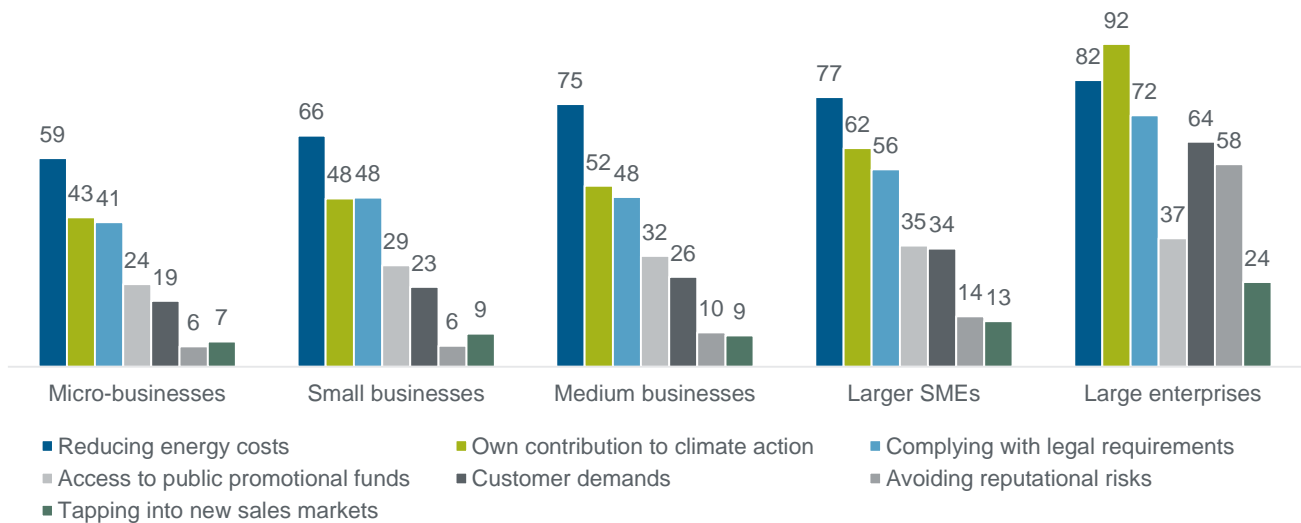
Source: KfW Climate Barometer 2022

Investment decisions of larger businesses more heavily influenced by stakeholders

The size of the business clearly influences the motives. Almost all motives are mentioned more often by larger companies (cf. Figure 16). This is most evident in their desire to contribute to climate action, a motive mentioned by fewer than half the micro-businesses and small businesses. This was the case in almost two thirds of larger SMEs (62%), and even in more than 90% of large enterprises. These results reflect the strategic mainstreaming of climate action, which also increases with the size of the business (Figure 3).

Figure 16: Motivation for climate investments by size class

In per cent



Note: The specific question was: 'What were or would be important motives for your business to make climate investments?' Multiple responses were possible.

Source: KfW Climate Barometer 2022

The responses provided by the businesses also offer insights into the deeper motivations. Perceived reputational risks, which also increase with the size of the enterprise, are likely to be an important factor. While this motive was reported by only 6% of micro- and small businesses, it was a notable 14% among the group of larger SMEs. In large enterprises that share even jumped to 58%, which underscores the presumption described at the start of the report that large enterprises are under significantly greater public pressure than small businesses, for example because of their reporting obligations.

The regulatory requirements also differ widely depending on the size of the business. Fewer than half the small and medium businesses see this as an investment motive, but nearly three fourths of large enterprises (72%). Market influences are another aspect in which the size of the business plays a very clear role. While only around 19% of micro-businesses see customer demands as a reason to invest in climate action, 34% of larger SMEs and nearly two thirds of all large enterprises (64%) do regard it as a motive.

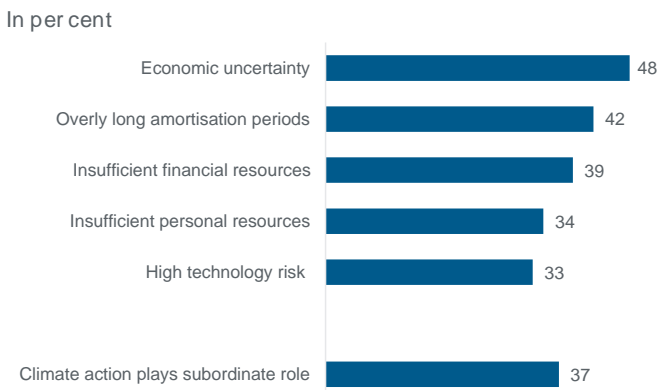
On a lower level, the potentials for tapping into new sales markets follow a similar pattern that rises from 7% among micro-businesses to 24% among large enterprises.

Economic aspects are the main barrier to climate investments

The economic dimension is not just the strongest motive for businesses to make investments in climate action. Uncertainty about cost-effectiveness is also the main barrier to investing (Figure 17). Around one in two businesses (48%) regarded it as a rather relevant or very relevant barrier. This was followed by unacceptably long amortisation periods (42%), an aspect that also addresses the cost-effectiveness dimension.

A similar number of businesses (39%) see insufficient financial resources as a barrier. The lesser role of the issue of climate action and the prioritisation of other topics in their operations were described by 37% of businesses as a barrier to climate investment. One third of businesses each mentioned staff shortages (34%) and unacceptably high technology risk (33%) as a barrier. This underscores again that the transformation can succeed primarily where an appropriate and predictable economic framework is in place.

Figure 17: Barriers to climate investment



Note: The specific question was: 'How relevant are the following barriers for the implementation of climate action investments in your enterprise?' The response categories were 'very relevant', 'rather relevant', 'less relevant', 'not relevant'. We report here on the share of enterprises that responded 'very relevant' or 'rather relevant'.

Source: KfW Climate Barometer 2022

Economic uncertainty is a disproportionately relevant barrier in manufacturing (55% and 60%). This is plausible because the conversion to new climate-friendly production technologies is fraught with major uncertainty, particularly in energy-intensive industries, and depends, for example, on the availability and future price of green hydrogen relative to fossil alternatives (e.g. in the steel and chemical industry). This uncertainty around cost-effectiveness can be reduced with a clear political commitment to a reasonable and rising carbon price and, in particular, with carbon contracts for difference (CCfD) and international carbon border

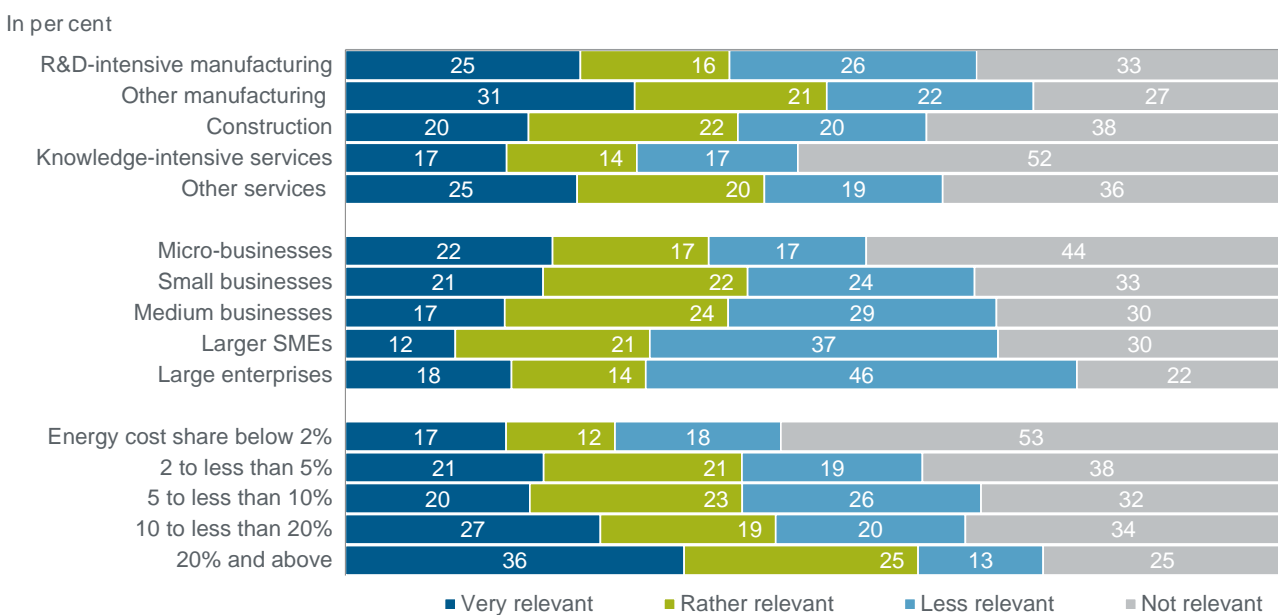
adjustment mechanisms (CBAM). Significantly higher energy costs than before the war in Ukraine are likely here to stay for an extended period of time,²⁴ which can also be expected to create additional incentives for businesses to switch to climate-friendly technologies.

Financial bottlenecks are relevant particularly for small and medium and energy-intensive businesses

Another major barrier to climate investments are financial bottlenecks. These can be addressed not so much through relative prices but either through attractive financing offers or blanket relief measures. It is therefore important to understand where financial bottlenecks are likely to present the greatest barriers. A breakdown by business size shows two opposing effects (Figure 18). On the one hand, small and medium businesses are more likely to classify financial bottlenecks as a very relevant or rather relevant barrier. On the other hand, the group of micro-businesses has the largest share of firms for which the lack of financial resources has no relevance at all. This is likely due to the comparatively lower average volume of climate investments in this group of businesses.

With a view to energy intensity, a clear pattern is evident. Financial bottlenecks are particularly relevant for energy-intensive enterprises. Of those businesses for which energy costs account for more than 20% of total costs, around one third of businesses reported that the lack of financial resources even presents a very relevant barrier to investment.

Figure 18: Lack of financial resources as a barrier to climate investments

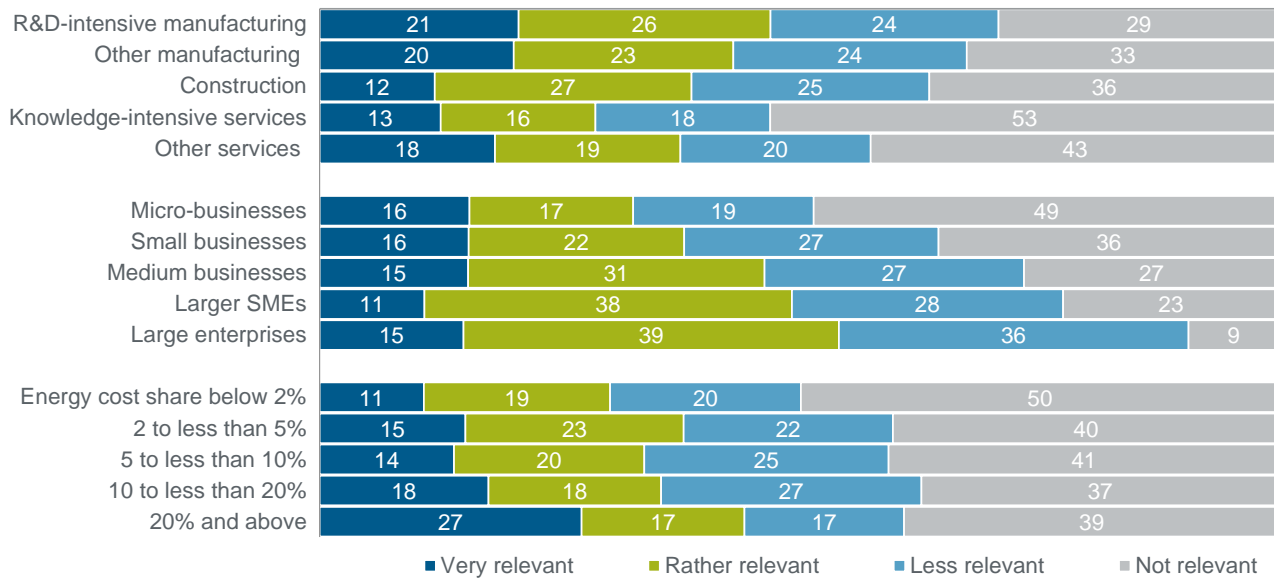


Note: Energy cost share means the share in total costs incurred by the business.

Source: KfW Climate Barometer 2022

Figure 19: Lack of human resources as a barrier to climate investments

In per cent



Note: Energy cost share means the share in total costs incurred by the business.

Source: KfW Climate Barometer 2022

Larger businesses are more likely to complain about staff shortages

Worker shortages can also hamper the implementation of necessary climate investments. In some cases, they can be resolved only in the medium term because it takes years to build and develop a skilled workforce. We therefore place a special focus on this dimension as well. The findings of the KfW Climate Barometer show that skills shortages in the context of climate investments have much greater relevance for larger businesses. This is somewhat surprising because there is no clear difference between size classes in the general skilled labour shortage.²⁵ In the case of climate investments, larger businesses may have a generally higher need for specialists with specific training, so that 54% of large enterprises and 49% of larger SMEs identify a corresponding shortage, but only 33% of micro-businesses (Figure 19).

Energy-intensive businesses are again most affected. Nearly half of businesses in which energy costs account for at least 20% of total costs incurred see their own climate investments jeopardised by skills shortages, and this issue is even very relevant for one in four enterprises (27%).

As a result, this group is under pressure in terms of both finances and staffing. This constellation appears to be particularly critical for two reasons. First, these businesses are particularly affected by rising energy costs, so that their current funding problems are likely

to even worsen if energy costs remain high permanently. Second, energy-intensive businesses in particular are called upon to successfully make the switch to climate-friendly technologies so that Germany's climate targets can be achieved.

Businesses' main request to policymakers: simplify planning and approval processes

Finally, businesses were asked how important particular policy measures to support climate investments were to them. There was a clear favourite here. Nearly two thirds of businesses (64%) believed that simplifying planning and approval processes was an important objective, and just under half even stated it was a very important one (45%). This request was expressed even more often than the call for promotional funds, which was the second most popular preference, at 59% (Figure 20). It reflects the public debate. There are few topics around climate action that enjoy such broad social consensus as the need for speeding up planning and approval processes. To achieve this, procedures must be standardised, digitalised and made less bureaucratic. This is also an area that does not require investment measures or high levels of new borrowings. But there needs to be a broad political drive to prioritise the transformation to climate neutrality. And the approval authorities also need to have more staff and better technical equipment.

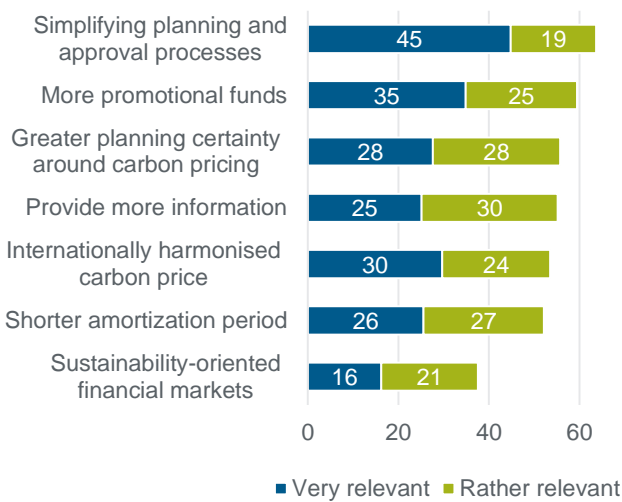
Greater planning certainty around carbon pricing ranked third among the wishes expressed (56%). This

broad consensus is also noteworthy because carbon pricing initially constitutes a cost for businesses. Still, planning certainty is one of the most important conditions for a favourable incentive-compatible investment environment. In addition, nearly as many businesses would like an internationally harmonised carbon price (54%), which would reduce competitive disadvantages.

Sustainability-oriented financial markets are a further element in the scientific debate on the transformation. The surveyed businesses expressed significantly less support to this approach. Just slightly more than one third of them considered that steps in this direction were important or very important (37%).

Figure 20: Support for policy measures

In per cent



Note: The specific question was: 'How important would the following policy measures be to promote climate action investments in your business?'

Source: KfW Climate Barometer 2022.

Conclusion

The transformation to climate neutrality presents a major challenge for businesses in Germany and requires extensive investment in all economic sectors. At the same time, the fossil fuel crisis has Germany firmly in its grip. The economic impact of Russia’s war of aggression against Ukraine is a considerable burden on businesses and households. The public debate is currently being heavily dominated by the immediate crisis response. Diversifying natural gas supply sources and mitigating energy price rises are a particular focus. The recently announced fiscal support package of EUR 200 billion, including the natural gas and electricity price brake, has the potential to ease some of the cost pressure on businesses and households for a limited period of time.

But there will not be a return to permanently low gas prices for the foreseeable future because Russian pipeline gas is being replaced primarily by imported liquefied natural gas, which is typically more expensive because it needs to be liquefied and shipped. That is why the structural solutions to the fossil fuel crisis must remain in focus: accelerating the expansion of renewables and systematically improving energy efficiency. Every additional renewable or saved kilowatt-hour can contribute to securing energy supplies and lowering energy prices.²⁶ Climate investment therefore plays a decisive role in overcoming the energy crisis while paving the way to climate neutrality.

The KfW Climate Barometer shows that many businesses recognise decarbonisation as a business challenge, but also that large white spots remain. On the one hand, more than half of businesses in Germany have at least partly anchored the topic of climate action in their own business strategy. On the other hand, only one in ten businesses currently aim to become climate-neutral, even though this target is to be achieved all across Germany by 2045. Almost half of all businesses are not even familiar with the concept of climate neutrality or have not yet dealt with it in any detail. Federal and state governments need to carry out information campaigns in order to increase awareness of the concept across the business landscape. Advisory services that are tailored to business sizes and specific sectors might also support enterprises in identifying technologies and processes that enable them to reach the goal of climate neutrality in the long term.

Another important finding of the KfW Climate Barometer is that nearly one fourth of enterprises invested in climate action projects last year. Larger enterprises and manufacturers were particularly keen to invest. In total, businesses in Germany invested approx. EUR 55 billion in climate action projects in 2021. This volume is considerable but needs to be increased again significantly to achieve the climate targets.

A study commissioned by KfW Research found that the business sector on average needs to invest around EUR 120 billion²⁷ annually – more than twice the current level – to reach Germany’s climate neutrality objective target. Current GHG emission reductions also need to follow a much steeper trajectory. The German Federal Government determined in its 2022 Climate Action Report that in order to achieve the 2030 GHG reduction target, in the coming years greenhouse gas emissions need to drop around three times faster than today.²⁸ This will also require additional efforts from the

business community across all sectors and size classes.

In the first half of 2022, businesses were still expecting mostly steady investment volumes for the year. However, it remains to be seen how the energy crisis will impact on investment appetite. On the one hand, the high prices of fossil fuels are creating stronger incentives to shift to renewables and improve energy efficiency. On the other hand, the extreme uncertainty about the economic consequences of the energy crisis are causing many businesses to postpone or abandon investment plans. In the SME sector alone, more businesses will have revised their investment plans during 2022 than ever before.²⁹ The overall reluctance to invest can also be expected to weigh on climate investments.

How can the necessary investment in climate solutions be incentivised? The findings of the KfW Climate Barometer show that cost-effectiveness is the most important factor determining business decisions for or against climate investments. In order for climate-friendly technologies to be able to triumph in the long term over fossil alternatives that damage the climate, a reliable and projectably rising carbon price signal, in particular, is a crucial factor for success. In designing European and German support programmes to mitigate the impacts of the energy crisis, it must therefore be ensured that the incentive effect of the carbon price in the EU emissions trading system and the national fuel emissions trading system is maintained. As some climate technologies incur high carbon avoidance costs, today's high energy prices alone are also insufficient to speed up the market penetration of important key decarbonisation technologies, particularly given that there is also high uncertainty about the future development of energy prices.

Not least, there is a need to establish an adequate funding and support framework for investments in climate solutions. Financial bottlenecks are particularly

relevant for small and medium businesses as well as for energy-intensive enterprises. Skills shortages are also an important factor that can hamper the implementation of necessary climate investments. In order to prevent labour shortages and the lack of qualifications from derailing the energy transition, this issue also needs to be more strongly addressed by the business community and policymakers, for example by supporting qualification measures.

When asked about their preferred policy measures to simplify investing in climate solutions, businesses mentioned a clear favourite. Nearly two thirds responded that simplifying planning and approval processes was necessary. This reflects the public debate. There are few topics around climate action that enjoy such broad social consensus as the need for speeding up planning and approval processes. To achieve this, procedures must be standardised, digitalised and made less bureaucratic.

In general, the findings of the KfW Climate Barometer show that larger enterprises are currently significantly more active in addressing climate change than smaller ones. This is the case with a view not just to the strategic anchoring of the topic within the business but also to the implementation of climate investments. Two reasons may explain this observation. For one thing, larger enterprises are usually equipped with more trained staff and financial resources, which makes it easier to systematically address a new topic such as the transformation to climate neutrality. For another, the analysis demonstrates that the pressure from stakeholders to take climate action also grows with the size of the enterprise. Obligations to report on environmental and social impacts and demands from customers and providers of capital therefore are also likely to play an important role for the activities of larger companies in the field of climate action. Against this backdrop, it can be assumed that small and medium-sized enterprises in particular require support in developing climate action strategies.

Box 7: Dataset of the KfW Climate Barometer 2022

Business investment in climate solutions is of high relevance for achieving Germany's national climate targets. From the year 2022, the **KfW Climate Barometer** 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 climate investments and attitudes concerning the implementation of the energy transition and climate neutrality. It provides a representative picture of the current situation, the needs and plans of all businesses.

The established survey instrument of the **KfW SME Panel** forms the starting point. It has been conducted since 2003 as a recurring postal 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 on the Internet at www.kfw-mittelstandspanel.de). A total of 10,796 SMEs took part in the current wave.

In order to obtain a comprehensive picture of the investment behaviour of all enterprises in climate action, the survey also includes **large enterprises** with an annual turnover of more than EUR 500 million. This segment, which has around 1,800 enterprises in Germany, was also surveyed in writing in 2022. Large enterprises and SMEs were 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, policy measures and their energy costs. Overall, 139 large enterprises participated in the survey.

The **basic population** surveyed for the KfW Climate Barometer thus comprises all enterprises in Germany. They include private-sector companies from all industries. Not counted 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 were weighted or extrapolated (net sample in relation to the basic population). The results are therefore **representative**. The data of the KfW Climate Barometer is also available to external researchers for use in exchange visits.

The 2022 survey wave was conducted by the Financial Services Division of GfK SE on behalf of KfW Group. The survey period ran from 10 February 2022 to 17 June 2022.

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

Supplementary information about the business sector in Germany:

In 2021 there were 3.796 million businesses in Germany. Approx. 3.1 million businesses are domiciled in the western German states (81%), while 689,000 (19%) are domiciled 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 enterprises in Germany is very small. Eighty-one per cent of businesses have fewer than five employees. That share has also grown by more than four 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 2021 the average number of employees was around 10.5 workers per business. In the SME sector (i.e. without large enterprises), the average number of employees including owner-managers was approx. 8.5. The greater fragmentation was primarily due to increasing tertiarisation.

Accordingly, economic activity is strongly shaped by services businesses. Around 79% 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 overall business landscape but provides employment to 16% of all workers. With around 36 employees, its average workforce is also significantly larger than in services businesses (around 10 employees) or the construction sector (approx. seven workers).

¹ Cf. Copernicus Climate Change Service (2022): Summer 2022 Europe's hottest on record, Press releases 8th September 2022.

² Cf. Deutscher Wetterdienst / Extremwetterkongress (2022): Was wir 2022 über das Extremwetter in Deutschland wissen (*What we know about the extreme weather in Germany in 2022* – our title translation, in German).

³ Cf. Prognos AG (2022): Extremweterschäden in Deutschland seit 2018. Studie erstellt im Auftrag des Bundesministeriums für Wirtschaft und Klimaschutz (BMWK) (*Extreme weather damage in Germany since 2018. Study commissioned by the Federal Ministry for Economic Affairs and Climate Action (BMWK)* – our title translation, in German).

⁴ Cf. Römer, D., Zimmermann, V. and Brüggemann, A. (2021): The future is green – what opportunities are available to German business?, Focus on Economics No. 355, KfW Research.

⁵ Cf. Agora Energiewende (2022): Schutz in der fossilen Energiekrise – Optionen für Ausgleich und Entlastung (*Protection in the fossil energy crisis – options for equalisation and relief* – our title translation, in German).

⁶ The subsegment of other manufacturing (non-R&D-intensive manufacturing) is mainly represented by enterprises operating in the food industry, wood processing and the manufacture of metal products, as well as other manufacturing not further specified.

⁷ Research- and development-intensive (R&D intensive) manufacturing is defined as those manufacturing subsectors whose average research and development intensity (R&D intensity: ratio of R&D expenses to turnover) is higher than 3.5%. The definition is based on what is known as the NIW/ISI list of research-intensive industries and services, which in turn follows the Federal Statistical Office's 'Classification of Economic Activities (WZ 2008)'. Engineering, medical technology, instrumentation and control technology, vehicles, pharmaceuticals and office equipment are of particular quantitative importance.

⁸ Cf. Abel-Koch, J. (2022): KfW-Internationalisation Report 2022: Ukraine conflict exacerbates global supply bottlenecks and jeopardises recovery of German SMEs' foreign business, KfW Research

⁹ Cf. Schwartz, M. (2022), KfW SME Panel 2022: SMEs have largely digested the pandemic, but the war in Ukraine and the energy crisis are clouding the business outlook, (forthcoming) KfW Research.

¹⁰ Studies have shown here that particularly in 2020, the first year of the pandemic, many businesses were more likely to undertake rather smaller adaptation investments in order to respond to the coronavirus restrictions (above all, adaptations in the area of digital sales or compliance with hygiene requirements). For details see Schwartz, M., and Gerstenberger, J., (2021), KfW SME Panel 2021: SMEs have shown adaptability in the coronavirus crisis but cracks are appearing in the foundations of small businesses, KfW Research.

¹¹ 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 were 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.

¹² Plausibility considerations underscore the value determined by the KfW Climate Barometer: For example, if we were to assume, as an approximate solution, that the 58% 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 37 billion. Alternatively, it could be assumed large enterprises invest in climate action in the same proportion to total investment as the SME sector (13% for 2021). That would be around EUR 33 billion. For more on total investment by the business sector, large enterprises and SMEs, see Schwartz, M. (2022), KfW SME Panel 2022: SMEs have largely digested the pandemic, but the war in Ukraine and the energy crisis are clouding the business outlook, KfW Research.

¹³ 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.

¹⁴ Cf. Brand, S. and Römer, D. (2022): Öffentliche Investitionsbedarfe zur Erreichung der Klimaneutralität in Deutschland (*Public investment required to achieve climate neutrality in Germany* – in German only), Focus on Economics No. 395, KfW Research. We also make the assumption here that negative emission technologies will be provided exclusively by private investments.

¹⁵ For figures on the previous years see Schwartz, M., Abel-Koch, J. and Brüggemann, A. (2021), German SMEs invest EUR 22 billion in climate action to remain viable and competitive, Focus on Economics No. 359, KfW Research.

¹⁶ For details see the results of two supplementary surveys in the KfW SME Panel on the topic of energy costs and energy efficiency: Schwartz, M. and Brüggemann, A. (2018), As energy prices fall, SMEs have lower costs – and increased efforts for energy efficiency and energy cost savings, Focus on Economics No. 223, KfW Research. – Schwartz, M. and Braun, M. (2013), Energy costs and energy efficiency in the SME sector, Focus on Economics No. 40, KfW Research.

¹⁷ Assuming a comparable distribution of target areas of investment between SMEs and large enterprises relative to overall investment in climate action (SMEs and large enterprises each account for roughly half of all climate action investments), the total business sector would be seen to invest roughly twice the amounts shown here for the SME sector.

¹⁸ For comparison: In 2021, the average investment volume of all businesses was 'only' around EUR 170,000, which was 44% below the average volume of businesses making climate investments (EUR 302,000 on average for all investment measures). That means businesses on average invested much less overall than those businesses with climate investments.

¹⁹ Knowledge-intensive services comprise service subsectors with an above-average share of university graduates in total employment, or services with a strong focus on technology. These include, for example, architecture and engineering firms, law firms, tax and management consultancies, data processing and telecommunication services. The definition is based on what is known as the NIW/ISI list of research-intensive industries and services, which in turn follows the Federal Statistical Office's 'Classification of Economic Activities (WZ 2008)'.

²⁰ Cf. Schwartz, M., Brüggemann, A. and Schwarz, M. (2022), Energiekosten im Mittelstand steigen: Unternehmen geben Preiserhöhungen weiter und ergreifen Maßnahmen zur Energieeinsparung (*SMEs' energy costs are rising: businesses are passing price rises on and taking measures to save energy* – in German only), Focus on Economics No. 384, KfW Research.

²¹ Schwartz, M. (2022), KfW SME Panel 2022: SMEs have largely digested the pandemic, but the war in Ukraine and the energy crisis are clouding the business outlook, (forthcoming) KfW Research.

²² It must be considered here that these businesses' internal funding structures also play a role in this understanding. Large enterprises often do not apply for loans just for individual projects but for the business as a whole.

²³ Cf. Römer, D. and Steinbrecher, J. (2021): KfW Energy Transition Barometer 2021, (in German only) KfW Research.

²⁴ For more on the development of natural gas prices, see e.g. Institute of Energy Economics at the University of Cologne (2022): Entwicklungen der globalen Gasmärkte bis 2030. Szenarienbetrachtung eines beschränkten Handels mit Russland (*Developments of global gas markets up to 2030. Considerations on the scenario of limited trade with Russia* – our title translation, in German). Report commissioned by Zukunft Gas e.V.

²⁵ Cf. e.g. Müller, M. (2022): KfW-ifo Skilled Labour Barometer May 2022, KfW Research.

²⁶ Cf. BDEW (2022): Gebotshöchstwerte für Erneuerbare müssen an aktuelle Kostensteigerungen angepasst werden (*Maximum bids for renewables must be adjusted to current cost increases* – our title translation, in German), press release of 10 October 2022.

²⁷ 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.

²⁸ Cf. BMWK (2022): 2022 Climate Action Report. Current as at 31 August 2022.

²⁹ Schwartz, M. (2022), KfW SME Panel 2022: SMEs have largely digested the pandemic, but the war in Ukraine and the energy crisis are clouding the business outlook, (forthcoming) KfW Research.