

Putting Climate Policy to the Test: Current Status and Outlook

Germany has come much closer to accomplishing the 2030 climate targets – that is the good news. However, this development is not linked to stronger sustainable economic growth and increasing green production potential. For the most part, the reasons lie rather in unfavourable business cycle developments, lower heating requirements due to rising temperatures and structural problems in industry. The Chief Economists of the Sparkassen-Finanzgruppe emphasise: Low emission levels must also be compatible with high economic growth.

- What is now decisive is to achieve a significant increase in investment in the necessary technologies and the infrastructure. It is imperative that the general investment conditions should be optimised. Bureaucratic requirements – especially for small and medium-sized enterprises – need to be streamlined. It is also essential that approval procedures are accelerated.
- Investments are long-term decisions. Government measures to reduce greenhouse gases must be reliably designed – this also applies to funding and sanction mechanisms.
- In addition to pricing CO₂ emissions, which has a growth-dampening effect if unilaterally designed, there should also be additional incentives to remove CO₂ from the atmosphere.
- What is crucial to the success of climate policy is that the general public is ready and willing to follow this path. Indigent households should be supported.

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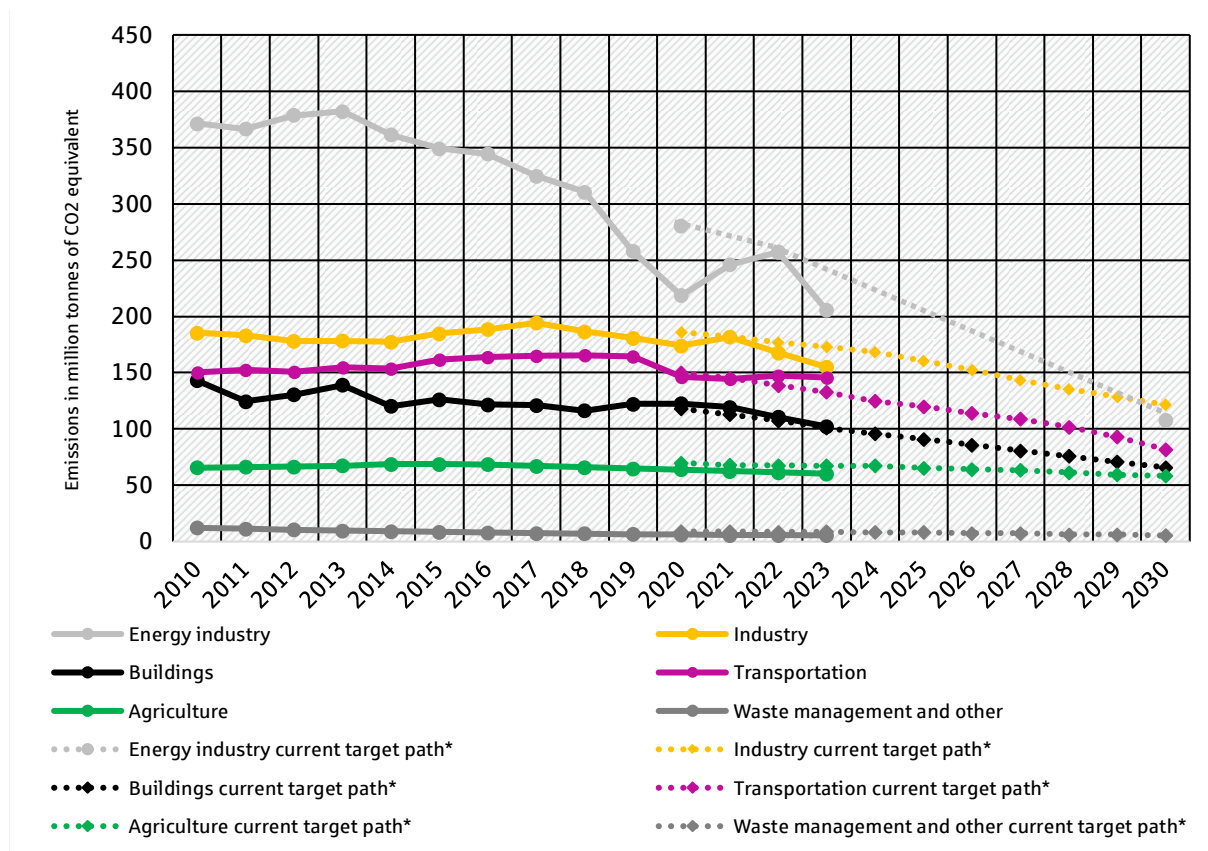
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Climate targets for 2030 achievable?

While the goal of achieving a CO₂-free economy is still more than two decades away, the first interim target for Germany's decarbonisation strategy is getting closer and closer, with the achievement of the 2030 climate targets. The last interim assessment by the German government was largely positive. When the data for greenhouse gas emissions in 2023 was published by the Federal Environment Agency in March of this year, the Federal Ministry for Economic Affairs and Climate Action – after adjusting its projections to bring them into line with the new data constellation – announced that it was on track for the first time. Compared to the previous legislative period, it had thus succeeded in closing the climate protection gap of more than 1,100 million tonnes of CO₂ equivalent (aggregated by 2030, based on 2021 projections). The secret of this proclaimed success lies not only in the measures adopted and weaker economic forecasts, but also, indeed above all, in the improved baseline, which is now 2023, the year in which the energy crisis triggered by the Ukraine war led to a massive exodus of energy-intensive production.

Climate protection gap closed in 2024 according to projections

Fig. 1: Development and target achievement of greenhouse gas emissions in Germany, as defined by sectors of the Climate Protection Act



* Pursuant to the amendment to the Federal Climate Protection Act dated May 12, 2021; the 2022-2030 time series has been adjusted to factor in over- and undershoots

Source: Federal Environment Agency 2024

According to the report, aggregate emissions fell year-on-year by 10.1% in 2023 to 674.0 million tonnes of CO₂ equivalent – a success that is primarily due to a sharp drop in the energy industry (share of 2023 emissions: 30.5%). In this sector with the highest emissions, emissions fell by 20.1% to 205.4 tonnes of CO₂ equivalent. However, the decline was accompanied by an 11.0% decrease in gross electricity generation. Given the distribution of electricity output, slightly more than half of the reduction in emissions can therefore be attributed to lower electricity production.

Electricity generation decreases, while the green energy share increases sharply

On the demand side, more efficient production processes or electricity-saving by consumers had less of an impact. A key role was rather played by favourable weather conditions and by the massive decline of output in energy-intensive industries (including chemicals and metal production). In addition, more electricity was imported on the supply side due to favourable import prices. Following the removal from the grid of its last nuclear power plants in mid-April 2023, Germany's role changed from being predominantly a net exporter of electricity to being a net importer, particularly of power from France.

At any rate, the operating hours of hard-coal-fuelled and lignite-fired power plants were significantly reduced again in 2023 compared to the previous year while the share of renewables in own generation increased from 44.1% to 52.0% thanks to the steady expansion of capacities. This positive trend continued in the first half of 2024. The Federal Environment Agency believes that the energy sector is currently well on track to accomplishing the 2030 emissions targets. Yet even the Federal Agency points out that significant efforts are still required to achieve this goal – above all to push ahead by then with the coal phase-out and to build new gas-fired power plants. The fact is that successful implementation of the plans appears highly questionable given the lengthy approval procedures and the capacity bottlenecks with which the construction sector is having to contend.

According to the Federal Environment Agency, emissions in industry (share in 2023: 23.0%), waste management and agriculture are likewise on track. In the manufacturing sector, CO₂ equivalent emissions fell by 7.7% as compared with an overall decline in production activity across all sub-sectors of 1.2% overall. However, output tumbled by no less than 12.6% in CO₂-intensive industries that are traditionally central to the German secondary sector, such as the chemical industry – an effect attributable, at least in part, to this segment's high degree of sensitivity to the economic cycle.

Decline in production in the industry

Emission reductions based on efficiency gains are therefore likely to have been manageable in this area. In the event of an economic recovery, however, production in the chemical industry and other cyclical industries can be expected to expand once again, leading to setbacks in emissions. If apprehensions that energy-intensive industries have migrated from Germany prove to be justified, that would certainly keep emissions on track

but would, at the same time, diminish Germany's growth potential in the long term. The agricultural and waste management sectors, whose combined share of emissions is relatively low at just under 10 percent and whose reduction targets are very moderate at -3.2 percent from the status quo in 2023 through to 2030, are of secondary importance in the struggle to achieve the 2030 climate targets.

Emissions trends in the buildings and transport sectors are more problematic. The climate targets were missed here in 2023, in some cases significantly. In the buildings sector (share of emissions: 15.2 percent), the undershoot was very small. This is mainly due to the low heating requirements and the still high energy prices. However, there have also been repeated reports recently showing that the energy-efficiency-renovation requirements for buildings to achieve the climate targets are not being met.¹ This is due to high costs and low profitability as well as a lack of capacity in the construction industry. On the upside, the bottlenecks in construction have at least been significantly reduced in view of the downswing in recent years.

In transportation (emissions share: 21.6 percent), the climate target has been missed for several years in a row, and achieving the preordained goals by 2030 now seems illusory. Vehicle electrification is progressing far too slowly. Indeed, sales of electric cars are even declining again in 2024 following the phase-out of purchase premiums last year. The low demand is not only due to the price-performance ratio of the models on offer, but also to the still inadequate charging infrastructure. What is more, the 15 million cars that are expected to be on German roads by 2030 would also multiply the electricity consumption of the transport sector. The promotion of rail travel via the Deutschlandticket (travel by all means of local transport for 49 euros per month) and investment in the national rail network are not yet sufficient to ensure that the transport sector reaches its targets.

*Transport sector
remains the big
problem child*

The binding nature of the sector-specific targets in Germany – particularly with regard to the transport sector – has already been repealed in an amendment to the Climate Protection Act, which came into force in July 2024. The success of the climate strategy is now only to be measured in terms of the achievement of overall emissions targets. On the one hand, this gives politicians more flexibility to react to undesirable developments and deviate from the rigid sector targets; on the other hand, the responsibility of the individual economic sectors for meeting their targets is weakened.

The emissions trend therefore certainly shows that Germany has already made big leaps towards achieving the 2030 climate targets. However, this is

¹ Cf. DIW Berlin 2023, https://www.diw.de/de/diw_01.c.879519.de/publikationen/wochenberichte/2023_33_1/investitionen_in_die_energetische_gebaudesanierung_auf_talfahrt.html (Energy-Efficiency-Renovation Investment is on a downward trend)

likely to be due, in large part, to the unfavourable business-cycle development, the rise in temperature and the structural problems in industry in some cases. Most importantly, high economic growth and low emissions can only be reconciled if there is a significant increase in investment in the necessary technologies and infrastructure.

Climate targets have been reached – without sufficient investment

Investment needs for climate protection

In order to guarantee the goal of climate neutrality, monitoring current CO₂ emissions is not enough; it is also necessary to continuously assess whether the investments currently being sunk into the transition to a climate-neutral economy are sufficiently high. A sustainable reduction in greenhouse gas emissions can only be achieved if investment in renewable energies and improved energy efficiency is increased. The challenge here is, on the one hand, to redirect investment which is forthcoming in any case (e.g. replacement investment) away from “brown” towards “green” applications entailing an emission-reducing effect. On the other hand, achieving the preordained climate targets will also require considerable additional investment, which in turn depends on improved climate policy incentives.

Significant additional investment in climate protection needed

Box: Definition of investment terms

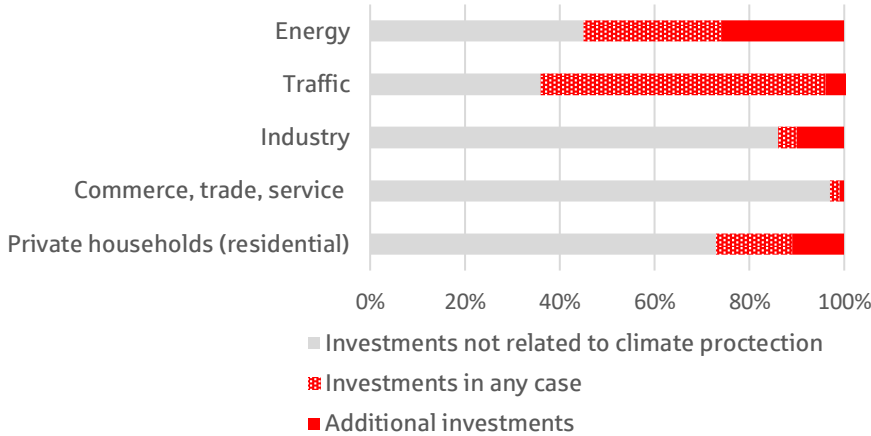
There is no precise, universally valid definition of what expenditure falls under the term climate protection investment. Rather, different definitions are used in studies and statistics, which makes comparability difficult. In a rather broad definition, climate protection investment include all measures that contribute to the reduction of greenhouse gas emissions. **Total climate protection investments** are always a subset of **aggregate economic investment**, which also include investments with no emission-reducing effect. When estimating a possible investment gap, the focus lies again on the **required additional investment** as a subset of the total required climate protection investments. These must be distinguished from the climate protection investments that would be made anyway, regardless of the goal of climate neutrality, and which, to a certain extent, amount to an extrapolation of the status quo. The “investments that would have been made anyway” include, for example, replacement investments in capital goods, which regularly have an emissions-reducing effect by virtue of technological efficiency improvements.

A Prognos study commissioned by Germany’s leading promotional bank KfW differentiates between the aforementioned investment aggregates on the basis of the investments required to achieve the climate targets (see Figure 2)². In relation to the total investment requirement per sector, the

² Prognos, Nextra, NKI (2021): „Beitrag von Green Finance zum Erreichen von Klimaneutralität in Deutschland“, (Green Finance’s Contribution to Achieving Climate Neutrality in Germany), study commissioned by KfW

highest additional investments are required in the energy sector, while the transport sector accounts for a high proportion of the “investments that would have been made anyway” category.

Fig. 2: Share of climate investment per sector



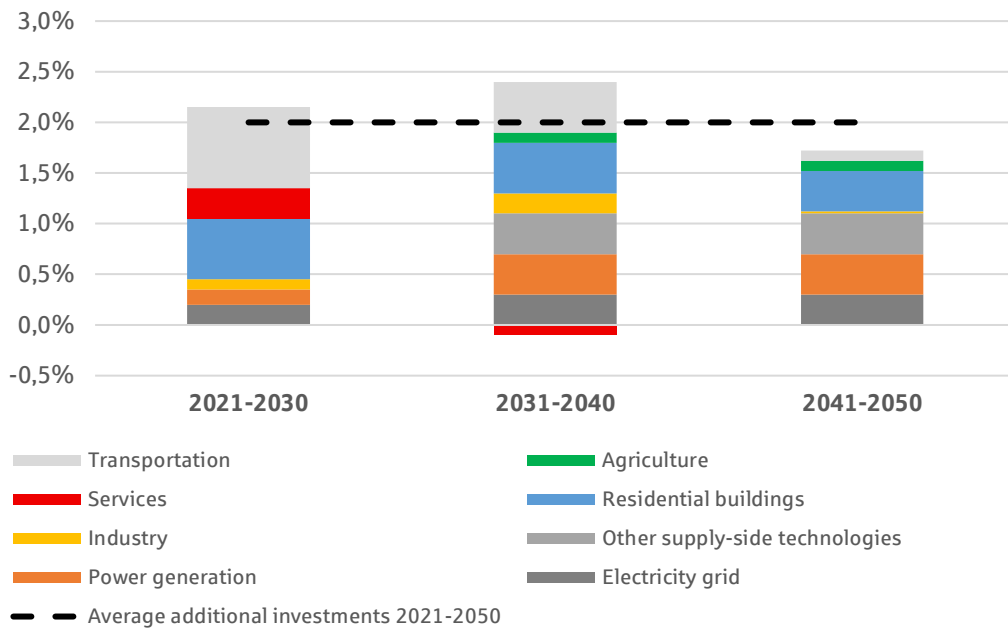
Source: Illustration Sparkasse Hannover based on Prognos et al. (2021)

It should be noted that, depending on the study design, additional investment may include measures that are already induced by the existing climate policy regulation. In order to eliminate this part of additional investment, studies (including the one illustrated above) typically generate a reference scenario in addition to the target path to climate neutrality, which factors in all measures already induced by the existing regulation. The investment gap is then calculated as the difference between the climate protection investment in the target path and in the reference scenario.

Several model simulations (impact reports), last updated by the European Commission in 2024, make it possible to project the additional investment required in the EU by 2050. The findings show that the “green” investment rate must already be increased by an average of two percentage points in the current decade compared to the status quo of 2011 to 2020 in order for climate neutrality to be achieved by 2050 (see Figure 3). Based on the EU models, the focus on the supply side is on expanding the electricity grids and increasing the production of renewable energies. On the demand side, the residential building and transport sectors account for the majority of the additional investment required.

Significant increase in the green investment ratio already required in the current decade

Fig. 3: Average annual additional investment in climate protection in the EU compared to the 2011-2020 level, as a percentage of GDP

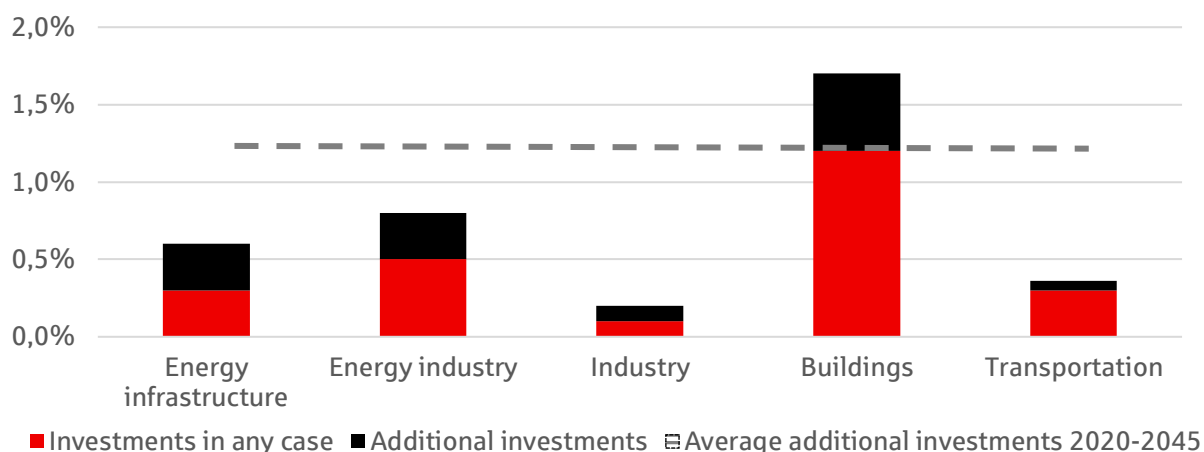


Source: Illustration by Sparkasse Hannover based on the Impact Assessment Reports SWD(2024) 63 and SWD(2021) 621

For Germany, Prognos et al. (2021) calculate a total additional investment requirement of 1.9% of GDP based on the German government's National Energy and Climate Protection Plan (NECP), which was last fully prepared in 2020. The additional investment requirement is measured against a reference development in which greenhouse gas emissions are reduced by 60 percent by 2050 compared to 1990 (extrapolation of the status quo). In a recalculation of investment requirements published this year on behalf of the Federal Ministry for Economic Affairs and Climate Action, Prognos calculated an average additional investment requirement of 1.2 percent of GDP by 2045.³ The benchmark for determining the additional investment is a significantly more favourable CO₂ scenario compared to the previous study. Under the reference scenario, greenhouse gas emissions are already reduced by 80 percent by 2045 compared to 1990. In order to achieve climate neutrality by 2045, additional investment is required primarily in the areas of buildings, energy management and infrastructure (see Figure 4).

³ Prognos (2024): „Klimaschutzinvestitionen für die Transformation des Energiesystems“. (Climate-Protection Investment enabling the transformation of the energy system), study commissioned by the Federal Ministry for Economic Affairs and Climate Action

Fig. 4: Average annual additional investment in climate protection in Germany in the target path, as a percentage of GDP



Source: Sparkasse Hannover based on Prognos (2024)

Overall, the additional investment requirements identified by relevant studies range between one and two percent of the GDP, with these being annual averages for the period in question (see Figure 5). The key takeaway is that the required increase in the investment rate in climate protection must primarily take place within the next ten years, which underscores the high political pressure to take action in order to mobilise additional investment funds.

Fig. 5: Study results on the extent of additional investment required in climate protection, as a percentage of GDP, annual averages

Study	Additional investment requirement in % of GDP	Region	Period
European Commission (2021, 2024)	2.0%	EU	2021-2050
Prognos et al. (2021)	1.9%	DE	2020-2045
Prognos (2024)	1.2%	DE	2020-2045
Boston Consulting Group (2021) ⁴	1.6%	DE	2021-2030
McKinsey (2021) ⁵	1.0%	DE	2021-2045
Direction générale du Trésor (2024) ⁶	2.7%	FR	2021-2030
ECCO (2023) ⁷	2.4%	IT	2020-2030

Source: Compilation by Sparkasse Hannover

⁴ BCG (2021): „Klimapfade 2.0“, Expert opinion for the Federation of German Industries (BDI)

⁵ McKinsey (2021): „Net-Zero Deutschland“

⁶ Direction générale du Trésor (2024): „How Much Investment Is Required To Reach France’s Decarbonisation Targets For 2030“

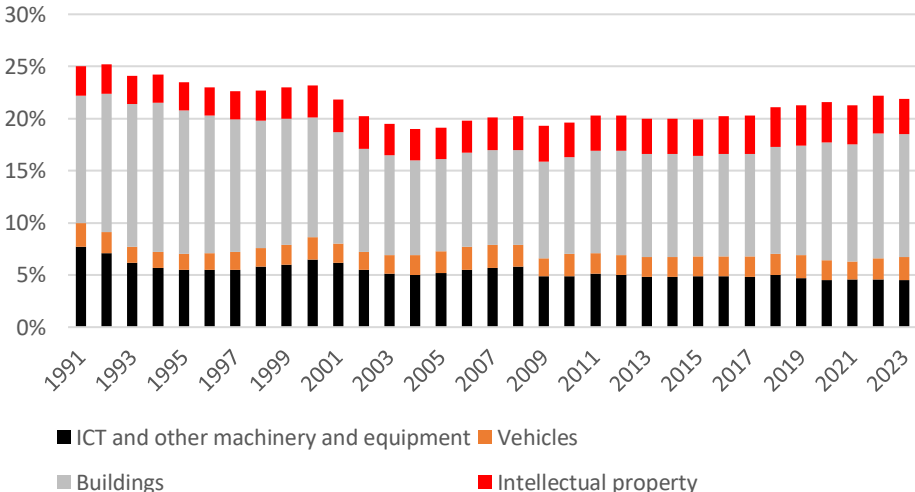
⁷ ECCO (2023): „How much Investment is needed for the Decarbonisation of the Italian Economy?“

It emerges from this that the additional investment required in Germany, measured as a proportion of GDP, are therefore slightly below the EU average, although comparisons between the studies are only possible to a limited extent due to differences in methodology and data definitions.

Current investment activity in the area of climate protection

A look at the overall economic investment ratio (gross fixed capital formation as a percentage of GDP) shows an increase over the last 10 years, which is primarily due to higher activity in the area of buildings. However, higher investment activity is required above all in the area of equipment (vehicles as well as ICT and other machinery and equipment) in order to achieve the climate targets.

Fig. 6: Gross fixed capital formation by sector (1991 - 2023), as a percentage of GDP



Source: Federal Statistical Office 2024, National Accounts, and our own illustration

The way current investment activity is evolving in the sectors relevant to the green transformation underlines that, despite progress in some areas, the required targets have not been met by a significant margin.

According to the Federal Statistical Office, climate protection investment in the industrial sector has increased by 72% on an inflation-adjusted basis over the last ten years. Such investment spend indeed increased by 25% in real terms to around EUR 5 billion between 2019 and 2022 alone, with ramped-up investment in renewable energies and measures to enhance energy efficiency contributing to this. The KfW (Climate Barometer 2023) calculated a real increase in total climate protection investment for the corporate sector as a whole (including manufacturing, construction, trade and services) of 18% in 2022 compared to 2021, pushing the figure up to EUR 72 billion. Yet even on the basis of the KfW figures, there was still an

An investment gap in the corporate sector persists

investment gap of EUR 48 billion (1.3% of GDP) in the private corporate sector in 2022.

In the private household sector, investment in energy efficiency measures in existing residential buildings and new residential construction is the most relevant metric. According to calculations by DIW Berlin (2023), investment in energy-efficient renovation of buildings (measures in the areas of heating, windows, insulation) was 13% below the 2011 level on an inflation-adjusted basis in 2022.⁸ By contrast, the volume of new construction rose by 43% in the same period. The increase in new construction activity is likely to be largely attributable to investment that would have been made in any case as a result of socio-demographic shifts in housing demand (including a growing population and shrinking household sizes). The additional investment required for climate policy in the residential building sector is unlikely to be met by an increase in new construction alone. This is particularly true in view of the slump in building permits since 2022.

Decline in energy-efficient renovations

According to the Federal Statistical Office, public investment in climate protection has largely stagnated in recent years, falling to EUR 3.5 billion or 0.1% of GDP in 2021 (latest available figure). Yet the public investment ratio must be increased to around 0.5% of GDP over and above the investments which would be made in any case in order to meet the climate targets.⁹ The public investment requirement is mainly attributable to the areas of energy (in particular renewable energy plants of publicly owned electricity producers) and transport (public share of the vehicle fleet, charging infrastructure, rail transport, overhead lines, etc.).

Public investment is stagnating

Interim conclusion

If the results of studies on the necessary investment requirements are juxtaposed with data on current investment trends, a veritable investment boom in climate protection is needed before the end of this decade if we are to have any realistic chance of achieving the interim targets for 2030 and of staying on course to achieve climate neutrality by 2045. The recent decline in greenhouse gas emissions is an instance of illusory progress, as the decline is cyclically overstated and is in part a symptom of the weakness of Germany as a production location. In order to protect the climate and safeguard economic prosperity, the further reduction of greenhouse gas emissions must be reconciled with the drive to expand the economy in the future. This requires additional climate and economic policy efforts.

Investment boom needed for climate protection

⁸ DIW Weekly Report 33 (2023): „Investitionen in die energetische Gebäudesanierung auf Talfahrt“ (Energy-Efficiency-Renovation Investment is on a downtrend)

⁹ Cf. KfW (2022): „Öffentliche Investitionsbedarfe zur Erreichung der Klimaneutralität in Deutschland“ (Public investment required for Germany to attain the goal of climate neutrality)

The boom in sustainable financing has slowed down

The heyday when green financing products were setting record after record came to an end in 2021. At that time, the global issuance volume of ESG-related debt instruments reached almost USD 1.8 trillion. Prior to that watershed, the market only knew basically one direction: further growth. Fueled by a new social awareness of the importance of climate change, the financial markets continued to develop new ESG-related financial products. In contrast, legislators were rather hesitant to act, and it was only with the presentation of the European Green Deal in December 2019 that the market began to benefit from political stimuli. The Green Deal envisaged a key role for the financial sector in the process of transition towards a climate-neutral economy. These developments supported the issuance of sustainable products, of green bonds in particular.

Green finance activity peaked in 2021

Another factor that steadily boosted issuance growth in 2021 was the central banks' expansive monetary policy. Low interest rates and bond purchases by central banks made financing cheap to obtain. Companies were able and willing to accept the small additional costs (incurred due to more complex reporting obligations and because of the need to set up new processes) when issuing sustainable products. In addition, the high demand for green financing products during this phase ensured attractive prices compared to conventional financing.

Loose monetary policy was supportive

This all changed abruptly in 2022 with Russia's invasion of Ukraine, which triggered an energy crisis in Europe and caused inflation to shoot skyhigh worldwide. Central banks were forced to increase interest rates to a drastic extent, which dramatically worsened the financing environment. Companies suddenly placed greater emphasis on gaining access to liquidity and set less store by sustainability. In addition, assets labeled as sustainable and companies from the renewable energy sector underperformed in 2022. As a result, the issue volume of sustainable debt securities fell for the first time in 2022 compared to the previous year, in line with the overall volume of bond issuance.

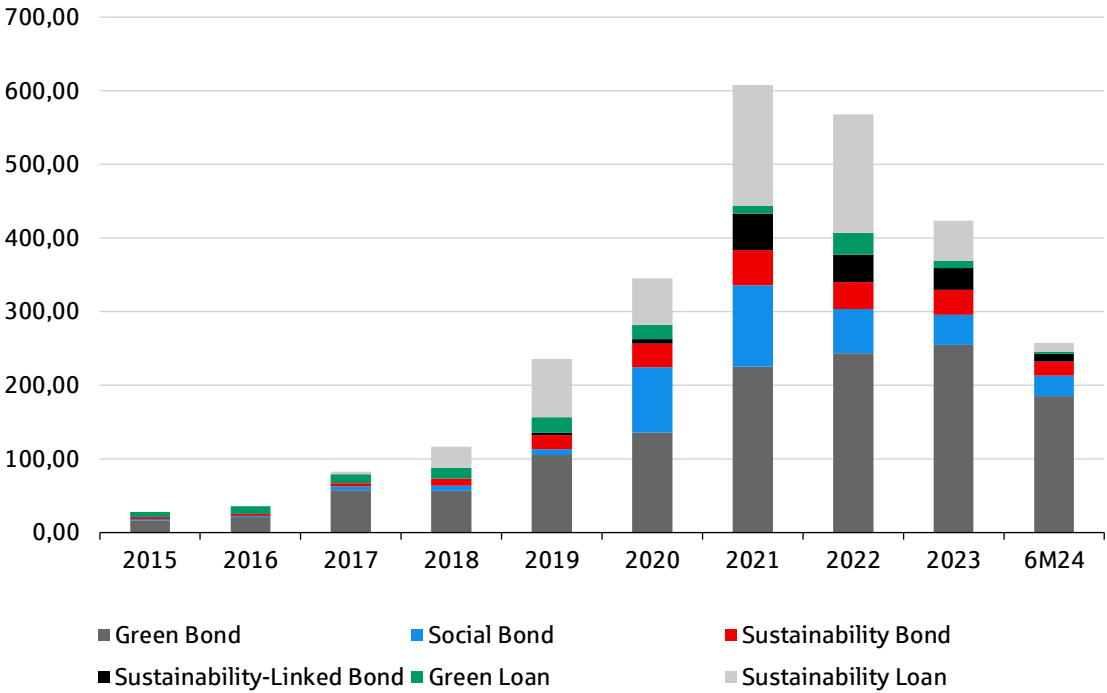
Energy security moved to the forefront

Demand for green bonds has also cooled. One part of the backstory here is the loss of confidence in green finance products marketed by institutional investors as a result of a number of greenwashing incidents since the end of 2021. On this score, national supervisory authorities established that certain fund providers had overstated their ESG investment. In order to restore the confidence of retail investors and to ensure real progress towards sustainability goals, regulatory requirements for fund providers have been tightened. The effects of the anti-greenwashing requirements were also visible on the supply side of sustainable bonds. The issuance volume of ESG-linked products, which had previously been characterised by low regulation and a lack of standardisation, fell by 64% in 2023. This trend does not appear to have been breached in the first half of 2024 either.

Even though the decline in sustainable emissions in Europe was less dramatic than in the US, where volumes in 2023 fell by 43% compared to the previous year, Europe also witnessed a sharp year-on-year decline of 25% last year (see Figure 7). This sharp decline was particularly visible in the credit segment, in the case of still novel and recently-criticised linked products. The bond market proved to be more stable and the long-established green bond segment in particular remained important for companies. In absolute terms, 2023 issuance volumes even exceeded their strong previous-year performance. It is true that the relative share of sustainable bonds in the overall market dwindled across all segments (see Figure 8). On the other hand, the market share commanded by sustainable products is expected to stabilise at 20% of the aggregate issuance volume in the first two quarters of 2024. On the back of increasing investment requirements for green technologies and infrastructures, the share of sustainable issues is likely to rise again marginally going forward. It is conceivable that, over and above the specific financing plans/projects concerned, the sustainability performance of the issuer to come into closer focus in future.

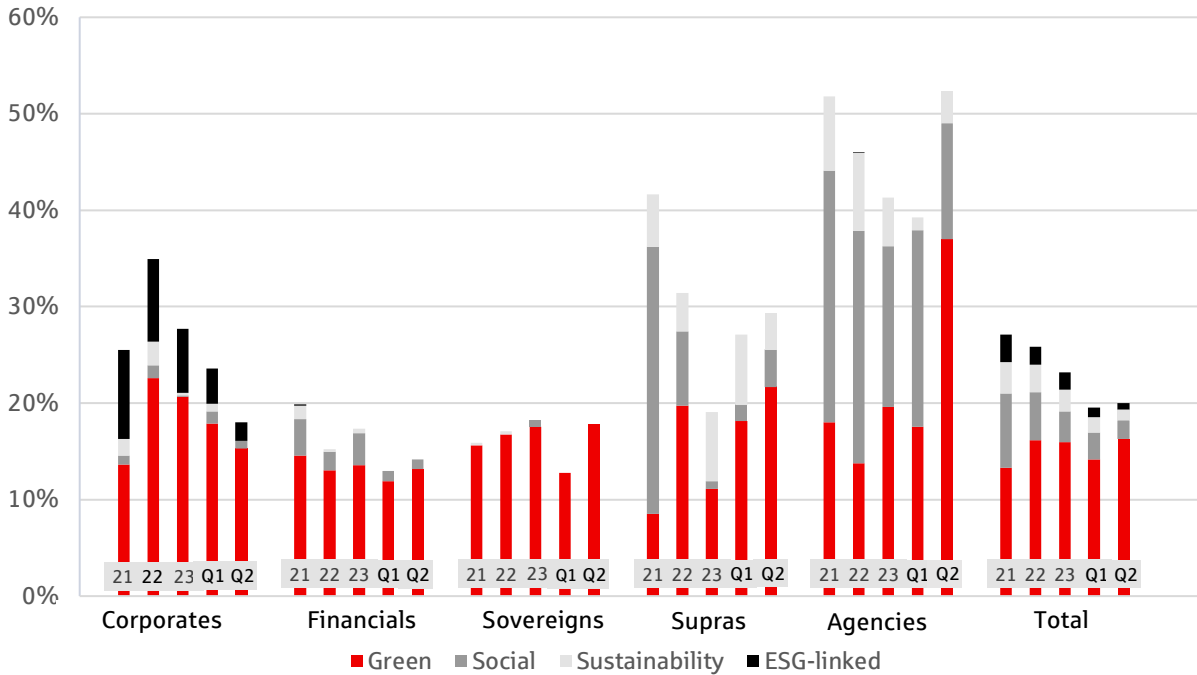
After a decline, the share of sustainable bonds shows signs of stabilising

Fig. 7: Issuance volumes of sustainable debt instruments, in billions of euros



Source: Bloomberg, BayernLB Research

Fig. 8: Share of bonds with an ESG theme in total euro issues



Source: Bond Radar, Bloomberg, BayernLB Research

Reliable political framework conditions are imperative

The decline in CO₂ emissions in Germany that has been reported in the meantime appears to have come at a high price in view of the disappointing economic development. The aim of policymakers must therefore be to swiftly create the conditions for a structural reduction in net greenhouse gas emissions in the more challenging financing environment while, at the same time, putting growth potential on a higher trajectory. An important prerequisite in achieving this goal is to improve general investment conditions. This task includes streamlining bureaucracy (especially regulatory burdens weighing on small companies) and speeding up approval procedures. Furthermore, it is particularly important for small and medium-sized enterprises that government measures to reduce greenhouse gases are implemented in a reliable manner – this applies to promotional and sanction mechanisms.

Improvement of general investment conditions necessary

The price of the most important instrument of European climate policy, CO₂ certificates, is determined by a market mechanism and is therefore subject to volatility. Here too, however, political decision-making determines the medium-term price path which has an important bearing on investment decisions. In addition to the expansion of certificates to buildings, road transport and for smaller companies with the introduction of the ETS2 system in 2027, the shortage of certificates in the existing ETS1 system is an important factor for the future price of CO₂ emission certificates. According to Bloomberg, the consensus assumes an increase in European CO₂ certificate

Rising CO₂ prices worsen competitive conditions

prices from the current EUR 70 per tonne to EUR 135 per tonne in 2029. Outside the EU, by contrast, a rise in the cost of CO₂ emissions is not on the cards. The competitive conditions for European and German industry are thus set to deteriorate. According to calculations by BayernLB Research and KPMG based on a general equilibrium model in which the CO₂ price effects are modelled at a sectoral level, this would have a dampening effect on growth in Germany of just under 0.2 percentage points per year over the next five years.

In order to prevent the deterioration of the competitive position due to rising CO₂ prices and at the same time prevent the relocation of CO₂-intensive production abroad (carbon leakage), the EU Commission already introduced the reporting obligation for particularly CO₂-intensive products as part of the Carbon Border Adjustment Mechanism (CBAM) in October 2023. And it is currently planned that these will be implemented from 2026 with corresponding certificates. In addition to problems with the recording of CO₂ emissions across supply chains, the CBAM is also encountering concerns from the World Trade Organization (WTO). Implementation of the measure therefore appears questionable.

Implementation of the CBAM looks to be questionable

In order to minimise the negative impact of rising CO₂ prices on overall economic activity, it would therefore be necessary to switch to low-carbon technologies as quickly as possible. In this context, it will be important to more robustly promote the step-by-step transformation of “brown” production processes by means of transitional technologies, which may require an adjustment to the taxonomy. In addition, the transfer of rising CO₂ prices to electricity prices should be capped by adjusting the merit order principle. This would involve introducing a discount on the merit order price for non-fossil energy sources in order to compensate for part of the rising CO₂ prices.

Capping the transfer of rising CO₂ prices to the electricity price

Nevertheless, low-income households will be disproportionately affected by rising carbon prices, partly due to the above-average consumption rate. In order to ensure social peace in the country, these households should also be supported. This support should only be paid out to those who really need it or offset against other support measures.

Support for low-income households

The goal is not gross-zero but net-zero emissions

Even if the investment measures in Germany were implemented quickly, this would only make a minor contribution towards reducing global CO₂ emissions. What is more, unavoidable process emissions will continue to be released in many sectors. Achieving the target of net-zero emissions cannot therefore be fully achieved merely by reducing gross emissions. Additional measures are needed to remove CO₂ from the atmosphere.

This is where carbon capture and storage (CCS) or utilisation (CCU) of CO₂ comes into play. The idea behind the technology is to capture CO₂ emis-

sions before they are released into the atmosphere. In the case of CCS, the captured CO₂ is transported to storage facilities where it is then stored permanently. Carbon dioxide can even mineralise over a long period of time and be bound in a solid form. Storage can take place both on land and in the seabed in depleted oil and gas reservoirs or saline aquifers. With CCU, the carbon is not stored. It can be reused for the manufacture of products. Where such techniques were highly controversial for a long time, and were indeed a taboo subject in Germany until recently, even the Intergovernmental Panel on Climate Change now advocates storing carbon dioxide (CO₂) so that the Paris climate target of limiting global warming to 1.5 degrees can still be achieved.

As part of an evaluation of climate neutrality studies for the current evaluation report on the German Carbon Dioxide Storage Act (KSpG), the role that can be played by CCS/CCU towards achieving the envisioned climate targets was also examined. An absolutely overwhelming majority of studies came to the conclusion that relevant quantities of CO₂ will have to be captured and stored, or else used, in the Federal Republic by as early as 2030 in order for the preordained climate targets to be met. At the end of May of the present year, the Federal Cabinet adopted the key points of the carbon management strategy. The KSpG is currently being revised. The German government's objective here is to remove obstacles and to create the basis for capturing hard-to-abate CO₂ emissions using modern methods before they are released into the atmosphere.

Nonetheless, the mere approval of CCS/CCU technologies is unlikely, in itself, to be capable of making a substantial contribution to net CO₂ reduction. In order to promote the technology and stimulate investment, limited financial support would be a welcome expedient. On this front, the Chief Economists of the Sparkassen-Finanzgruppe already proposed in 2019 the introduction of a symmetrical CO₂ tax, involving a positive tax rate on CO₂ emissions and a negative tax rate (subsidy) as a reward for CO₂ absorption. In order not to overstretch government budgets, state subsidies should be capped; otherwise, revenues from taxation of CO₂ emissions should be used to cover expenditure.

Ottmar Edenhofer¹⁰ and others have been discussing similar models based on CO₂ certificates, and are themselves proposing the issuance of clean-up certificates, under which companies can initially continue to emit CO₂ but commit to absorbing CO₂ from the atmosphere further down the line (once CCS/CCU technologies have become more advanced).

¹⁰ Edenhofer, Ottmar: Emissions Trading with Clean-up Certificates: Deterring Mitigation or Increasing Ambition? (CEPA Discussion Papers, 79) (uni-potsdam.de)

In the opinion of the Chief Economists of the Sparkassen-Finanzgruppe, such approaches should be pursued in order to achieve the goal of net zero as quickly as possible and, at the same time, to open the door to innovative technologies and corporate business models. Absorption measures deemed suitable to be promoted should have a clearly limited time horizon. The primary objective must continue to be to develop and promote business models that prevent CO₂ emissions from occurring in the first place.

Private households and municipal utilities face particular challenges

As delineated above, major investment spending will be required in the building sector in the coming years in order for CO₂ emissions to be reduced. In this connection, it needs to be weighed up carefully to what extent the reduction can be achieved through structural measures or a transition to a different energy source. Heating (and, in future, increasingly, cooling) plays the most important role here. While private households are primarily responsible for structural measures, the focus is on municipal suppliers when it comes to the heating supply. According to a joint study by VKU, bdew and Deloitte, there is a financing of EUR 600 billion will be required on this score in the period to 2030. As such a financing requirement cannot be shouldered solely through external financing, there is a great need for new funding constellations. Increased consideration should also be given to citizen participation. The Sparkassen-Finanzgruppe can play an important role in implementing these measures. It is possible, though, that state guarantees may also be required for the corresponding measures to be translated into reality.

High capital expenditure on real estate and heat supply

Conclusion: Promote entrepreneurship

Developments in 2023 have made it clear that Germany has not yet succeeded in reducing CO₂ without imposing a burden on economic activity. In order to continue to have a chance of achieving the CO₂ targets without jeopardising prosperity, a rethink is required. The focus of policy should be on promoting entrepreneurship in order to enable green investments and innovations. In contrast to the current fragmented regulations, legislators should concentrate on simple framework conditions that provide incentives to reduce CO₂ emissions or accelerate the absorption of CO₂ from the atmosphere. A banking sector capable of taking decisive action is needed in order to bankroll the immense investment expenditures involved. So as to enable the necessary innovations, it is also imperative to step up the financing of start-ups and improve the conditions for venture capital.

Disclaimer

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