



Climate Action Tracker

Germany's proposed 2030 national target not yet 1.5°C-compatible

May 2021

1 Introduction

To be in line with the 1.5°C limit of the Paris Agreement, Germany's new 2030 domestic reduction target should aim for national emission reductions of at least 69% below 1990 levels. To fully contribute its fair share Germany would have to significantly increase its international climate finance. The programme to implement this target would need to include a coal phase-out by 2030, a renewable energy target for the electricity sector increased to around 90% or more by 2030, a fast uptake of electric vehicle sales to at least 95% of the market by 2030, and a reduced emissions intensity of Germany's heavy industry. The proposed target of 65% by 2030 falls short of 1.5°C compatibility.

In the wake of a constitutional court ruling that Germany's climate targets are not strong enough, the German government has proposed new targets that are [likely to get the green light](#) in the Cabinet on 12 May 2021. The new targets, announced on 5 May 2021 by Finance Minister Olaf Scholz and Environment Minister Svenja Schulze and confirmed by Chancellor Angela Merkel the following day, include the target of a 65% national emissions reduction below 1990 levels by 2030 (up from 55%), a new, interim target of 88% below 1990 levels by 2040, and climate neutrality by 2045 (five years earlier than its previous net zero date).

2 Domestic 2030 and 2040 targets

A 1.5°C-consistent domestic emissions reduction target for Germany would entail reductions of at least 69% below 1990 levels by 2030,¹ 4 percentage points more than the 65% on offer.

The CAT has derived "1.5°C consistent domestic emissions pathways" from downscaling global and regional 1.5°C compatible scenarios from the IPCC special report on 1.5°C, filtered to account for sustainability constraints on bioenergy use rates and magnitude of carbon dioxide removal. These scenarios distribute emission reductions across countries and sectors in a cost optimal way to limit global temperature rise to below 1.5°C by the end of the century (Figure 1).

With such a target Germany would halve its emissions in the next 10 years, a trend that is required globally to put the world on a pathway towards 1.5°C. These pathways do not reflect a country's full fair share contribution to implementing the Paris Agreement, an issue which is addressed below, as this also necessarily includes contributing to the reductions needed in developing countries through climate finance.

Germany's proposed 88% reduction target for 2040 meets our estimate of a 1.5°C-compatible domestic emission reduction pathway of at least 84% by 2040.²

Under the Paris Agreement, all countries are expected to submit higher targets this year (originally 2020, but COVID-19 has delayed this by a year). As part of the European Union and its Member States, Germany also has an obligation to upgrade its 2030 targets. Targets for post 2030, in particular 2035, are due to be submitted by 2025.

1 The full range we estimate using our methods is 69 to 77% reduction, excluding land-use change and forestry.

2 The full range we estimate using our methods is 84 to 94% reduction, excluding land-use change and forestry.

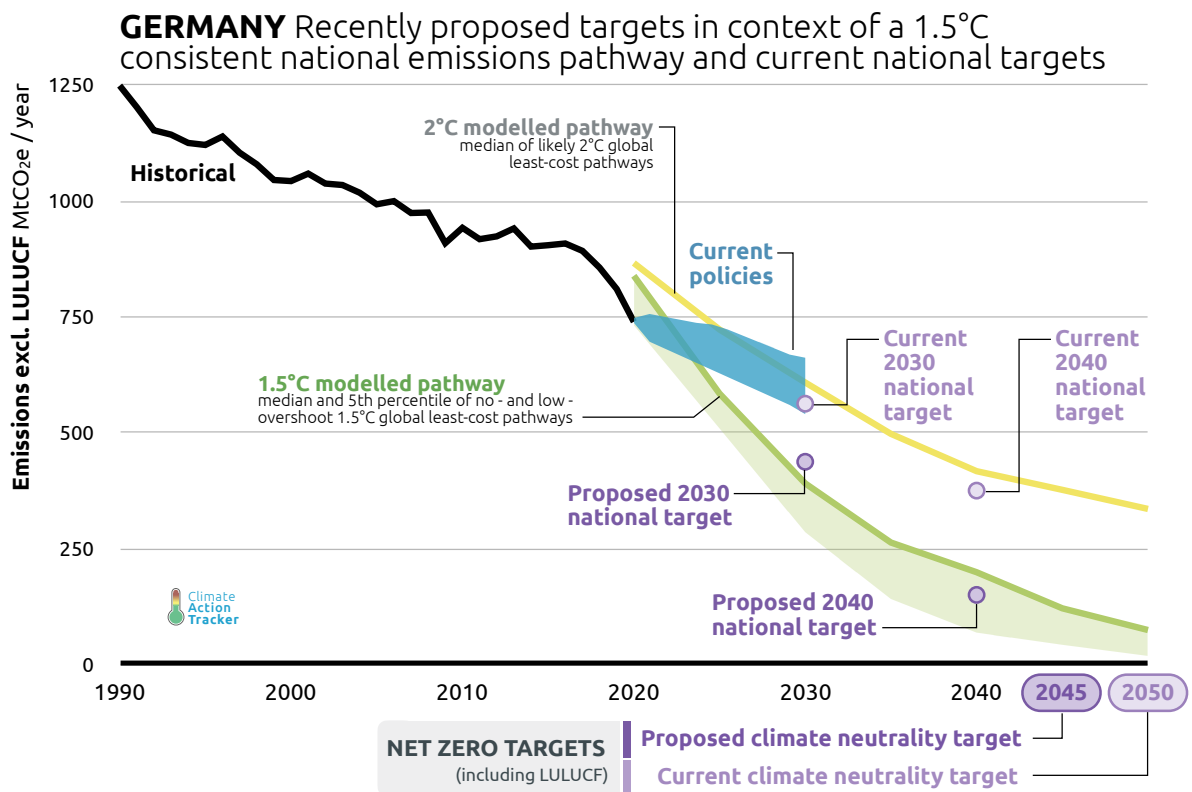


Figure 1: Domestic GHG emissions pathways for Germany that would be consistent with 1.5°C and 2°C global least-cost scenarios (excl. LULUCF), historical emissions for 1990–2020, current policy projections and current and proposed national targets. See the bottom of the article for a summary of the methodology and assumptions used.

3 Climate neutrality target for 2045: careful about negative emissions

Germany’s proposal to move its climate neutrality target from 2050 to 2045 is a positive move. Achieving net zero by 2045 would help to reduce the need for negative emissions and, if followed globally, would also increase the likelihood of limiting warming to 1.5°.

However, care will need to be taken in implementing this target to make sure that it does indeed result in net zero greenhouse gas emissions.

The global cost-effective pathways assessed by the IPCC (as shown in Figure 1) provide useful guidance for an upper-limit of emissions trajectories for developed countries like Germany to meet their domestic obligations under the Paris Agreement. They underestimate, though, the feasible space for such countries to reach net-zero earlier, as they tend to depend strongly on land-use sinks outside of currently developed countries and include fossil fuel use well beyond the time at which these could be phased out, compared to what is understood from cost-effective, bottom up approaches.

On the other hand it is also well-established that, for some sectors - such as agriculture - it will be very difficult to reach zero GHG emissions. This means there are likely to be significant emissions remaining in 2045 even with a more advanced phase-out of fossil fuels. In this sense, the range of residual emissions in the cost effective pathways provide some guidance that there could be many tens of megatonnes of CO₂ emissions remaining that need to be compensated for by negative CO₂ emissions in 2045. Land sector uptake of carbon is projected to decrease in Germany, and to be a source by the mid-2030s in the order of 20 MtCO₂e per year, adding to the negative CO₂ emissions requirements.

Different approaches could be used to produce negative CO₂ emissions, including biomass energy, carbon capture and storage and direct air capture of carbon dioxide. However, over each of these have significant sustainability constraints that will need to be carefully taken into account. The likely

scale of deployment of negative emissions will depend on how rapidly fossil fuels are phased out, however negative emissions in the range of 50-100 MtCO₂ per annum in 2045 cannot be excluded.

Finally, it would be important to avoid achieving a net zero greenhouse gas emissions via accounting methods such as purchase of greenhouse gas offsets. These are unlikely to be real, additional emission reductions and may simply displace the need for reaching net-zero greenhouse gas emissions physically to another country or region.

4 Germany's full fair share contribution to the Paris Agreement

For wealthy developed countries, achieving 1.5° compatible domestic emissions is only one part of their fair share of contributing to global efforts to meet the Paris Agreement goals. The assessment above relates to Germany's national emission targets. To get a view of its overall contribution to global efforts one also needs to estimate its contribution to climate finance in different dimensions. This includes the country's contribution to international climate finance for mitigation, as well as actions taken to stop investment in fossil fuel developments abroad.

If this requirement to contribute to global efforts were expressed as equivalent to a domestic reduction target, Germany would need to reduce its emissions to zero by around 2030, which is far outside the cost optimal range shown above. This illustrates why there needs to be a very substantial contribution to international climate finance for mitigation action by Germany. To make up for this gap, Germany would have to significantly support developing countries in making this transition.

Whilst it is beyond the scope of this briefing paper to examine this issue in detail, the overall level of Germany's climate finance contribution would need to be increased in overall terms to become sufficient according to multiple metrics. Angela Merkel, in her speech at the Petersberg Dialogue on 6 May 2021, was silent on the question whether the finance contribution would increase in the future. This issue will be dealt in more detail in forthcoming Climate Action Tracker assessments.

5 Four Paris Agreement-compatible sectoral benchmarks for Germany

To illustrate what Paris Agreement compatibility would mean at a sectoral level, the CAT has looked at planned measures from the German Climate Action Programme 2030, adopted on the basis of the old climate law, for four sectors and compares them with benchmarks defined for the EU in its [benchmarks report](#).



Power sector

In its [Climate Action Programme 2030](#) the German government aims to raise the share of electricity generated from renewable energy to 65% of gross electricity generation by 2030. This goal is not aligned with the Paris Agreement, based on the benchmarks defined by the CAT for EU countries.

At the EU level, to be compatible with the Paris Agreement 1.5°C temperature limit, the share of renewables in the electricity sector need to reach a minimum of [70-90%](#) by 2030. For Germany, [studies](#) suggest that the share of renewable electricity in total generation needs to reach 85-100% by 2030 to be compatible with a 1.5°C pathway. IPCC SR 1.5 pathways described above and downscaled to Germany indicate renewable energy generation in the power sector of 89 to 94% by 2030. Taken together these studies indicate that a renewable energy target for German electricity generation of around 90% or more would be consistent with meeting the Paris Agreement 1.5° limit.

While the quantifications of the Climate Action Programme 2030 suggest the 65% RES target is likely to be met (61-65% in 2030), [other studies](#) show the German government has not yet implemented enough measures to reach this insufficient target. This is due to the fact that contrary to the assumptions of the German government, electricity demand is projected to significantly increase due to increased electrification for decarbonising other sectors.

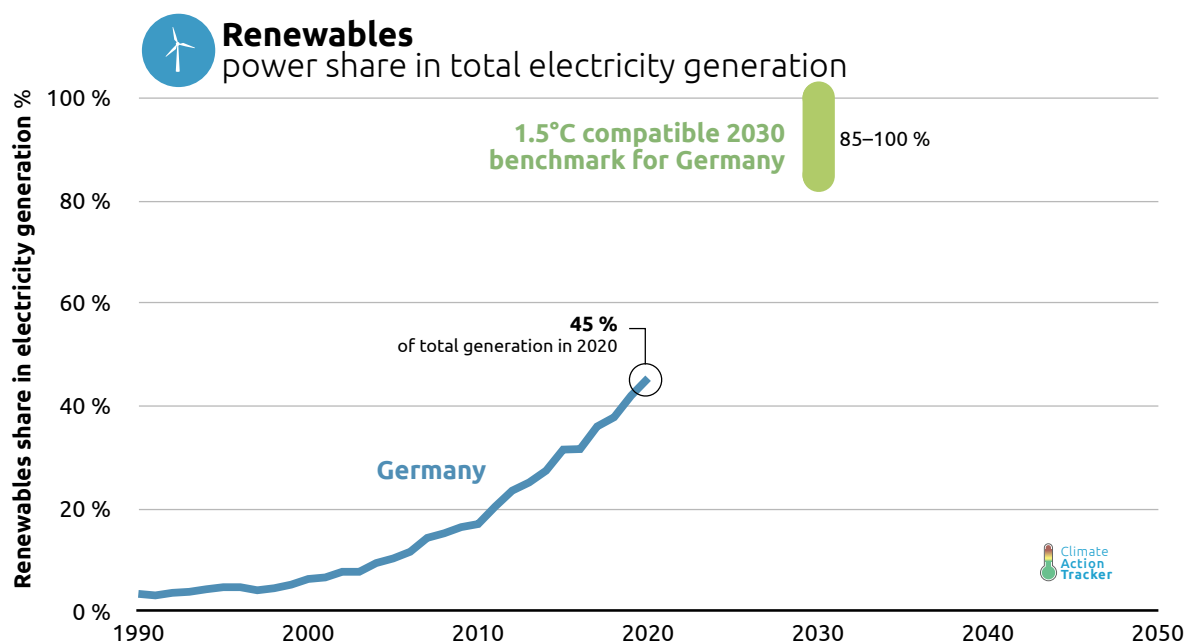


Figure 2: Share of renewable electricity in Germany - Historical trend and Paris Agreement compatible Benchmarks (sources: [BMW](#), [DIW](#), CAT analysis).

While Germany has agreed on a coal phase-out by 2038, the schedule is not fast enough to be compatible with a 1.5°C pathway: the CAT analysis shows that the share of unabated coal in the power sector would need to reach 0% by 2030 for EU countries, i.e. a full coal phase out for Germany by 2030, eight years ahead of its current plans.

Transport sector

Germany’s transport sector still has a long way to go. Although emissions dropped by 11% in 2020, they still leave a gap of 50 MtCO₂e over the next decade to reach the currently insufficient 2030 sectoral target, which is the largest gap of all sectors in Germany.

To close this gap the German Government proposed several measures in its Climate Action Programme, including an increased budget for improvement and expansion of public transport, a carbon price on fuels of initially €25/tCO₂, incentives to develop electric automobile industry and infrastructure, including one million public charging points for electric vehicles by 2030, or tax benefits for electric company cars. The measures, however, would still leave a gap of more than 30 or 40 MtO₂e/year under the current and proposed sectoral target, respectively.

The Climate Action Programme 2030 has set a goal of 7-10 million electric vehicles in the German vehicle fleet by 2030. However, initial results from the CAT’s modelling (see Methods and Assumptions) suggest that the current support of €6,000 per vehicle (€9,000 until 2021), together with the rest of the policy package already in place in Germany, would lead to an uptake of EVs of approximately five million by 2030.

This would correspond to a share of 30% of EVs in cars sold in 2030, which is not in line with the Paris Agreement-compatible benchmark of 95-100% for the EU. Setting a date for the complete phase-out of new combustion engine vehicle sales (following examples of Norway 2025 or California 2035) would be an important step forward in decarbonising the German transport sector.

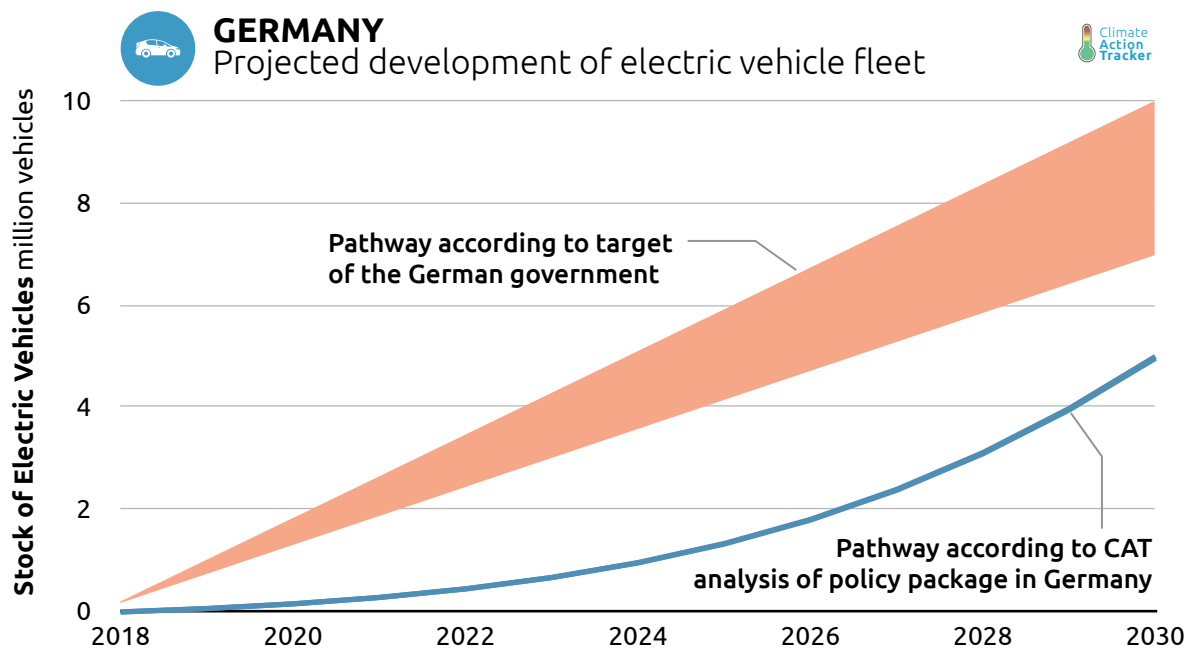


Figure 3: Projected development of Germany's electric vehicle fleet under government targets and currently implemented measures (sources: CAT analysis).



Industry

The industry sector is the second-largest source of emissions in Germany and emission levels have been stagnating over the last decade. The Climate Action Programme includes several measures focusing on the improvement of energy efficiency and proposes streamlining the existing support programmes into a “one-stop-shop” and promises additional support from low carbon technologies in areas where reductions are difficult, but without any detail of the level of available funding.

Since then, the German cement industry has presented [plans](#) to become climate-neutral by 2050, the German government has published a [strategy](#) for climate-friendly steel production and pledged an additional five billion euros on the climate-friendly restructuring of the steel industry between 2022 and 2024, funding decarbonisation programmes, a hydrogen project and a pilot project for climate protection contracts. While these are steps in the right direction, they are likely insufficient to reach a full decarbonisation of the sector by 2050: clear implementation plans as well as technology breakthroughs are required.

For steel production, the largest emissions source within Germany's industry sector, the CAT's analysis indicates that to be compatible with the Paris Agreement the emissions-intensity of steel would need to be reduced by [45% by 2030](#) below 2015 levels for EU countries. To reach these benchmarks requires a clear policy framework, including, for example, [carbon contracts for difference](#) or green hydrogen quotas, and investment security.

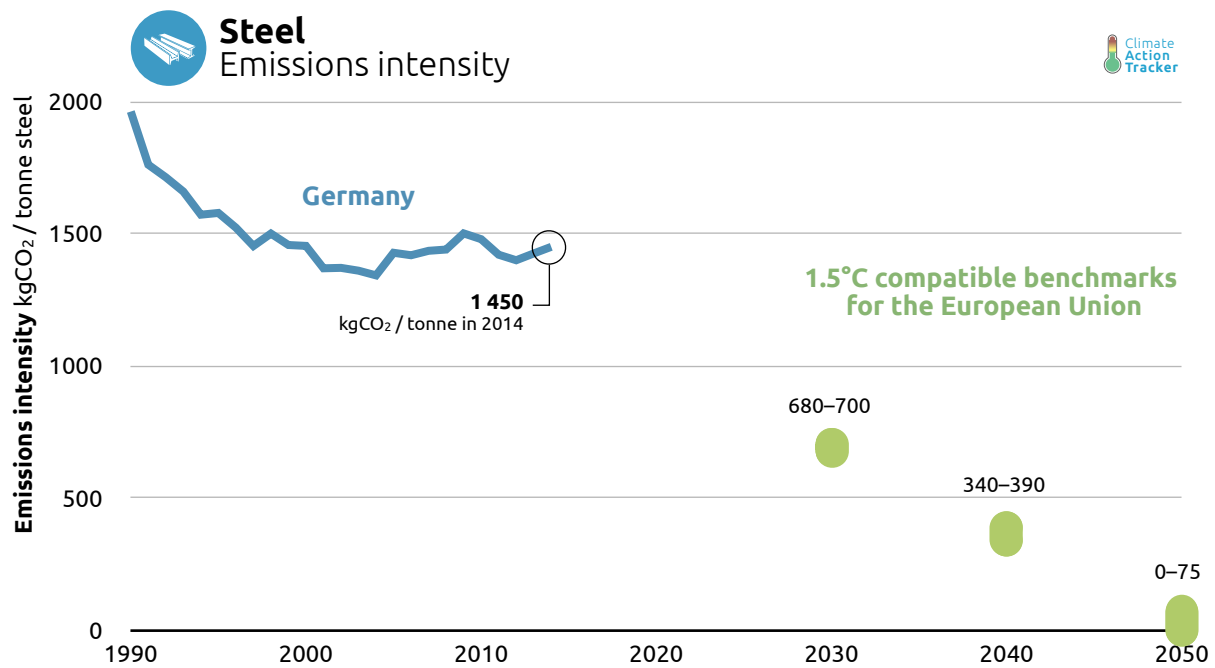


Figure 4: German steel emissions intensity - Historical trend and Paris Agreement compatible Benchmarks (sources: CAT data portal).

Buildings sector

The German government committed in its Climate Action Programme 2030 to reduce the carbon footprint of the buildings sector by about 40% by 2030 below 2015 levels, through a new carbon price of initially 25€/tCO₂, additional support for energy-efficient retrofits, swap premiums for replacing oil-fired heating systems and holding public buildings to higher efficiency standards.

However, to be Paris Agreement-compatible, the CAT analysis indicates that by 2030, emissions in the German buildings sector should be around 60% lower in residential buildings, and 75% lower in commercial buildings compared to 2015 levels. The current plan still subsidizes the installation of efficient gas heating systems. Germany could for example follow the Netherlands in phasing out gas by not connecting new houses to the gas network.

Global least-cost pathways

The CAT's 2030 reduction target of 70% is derived from global model runs of the IPCC special report on 1.5°C that distribute emission reductions across countries and sectors in a cost optimal way to limit global temperature rise to below 1.5°C by the end of the century. The result of this analysis indicates plausible emission reductions that Germany can undertake domestically but does not determine whether this is a fair contribution of Germany to the Paris Agreement.

For each of the global least-cost emission pathways, the emissions of the OECD region are distributed amongst the OECD member states following an extension of the Impact, Population, Affluence, and Technology (IPAT) method that was developed by (van Vuuren, Lucas and Hilderink, 2007) and refined by ([Gidden et al., 2019](#)). It assumes country-specific emission intensities converge from their present-day values to the regional value for each given Integrated Assessment Models (IAM) pathway by the end of the modelled time horizon (i.e., by 2100). We then assess the full distribution of downscaled outcomes to find the median of country-level emissions pathway in order to form an upper-bound for Paris-Agreement compatibility for each country.

Development of electric vehicle fleet in Germany

The CAT compares the support provided for EVs with that in Norway and the corresponding development in the shares of EVs. For more information, see NewClimate Institute's "Electric vehicles policy impact quantification tool" ([De Villafranca Casas et al., 2018](#)).