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## **2024 German Climate Adaptation Strategy**

### Summary

The impacts of climate change in Germany are tangible and quantifiable. In Germany and around the world, 2023 was the hottest year on record since measurements began in 1881; the average temperature in Germany has already risen by 1.8°C (linear trend) since then. The years 2014 to 2023 were already 2.3°C warmer than in 1881. At the same time, Germany has experienced devastating effects from heavy rainfall and flooding in recent years, particularly in 2021 and most recently in 2024. In future, all regions of Germany will be affected by a further rise in temperatures, an increase in the numbers of hot and dry days and a greater risk of heavy rainfall and flooding. Depending on the rate of global warming, the cumulative economic damage is expected to reach 280 to 900 billion euros by mid-century.

That is why the German government has made adaptation to the impacts of climate change a top priority in the 20th legislative period, alongside ambitious climate action. To tackle this challenge, it has created a new, binding framework for this with the Federal Climate Adaptation Act (Klimaanpassungsgesetz, KAnG). The Act requires the federal, federal state and municipal governments to address the impacts of climate change across the board and identify adaptation measures. This new precautionary climate adaptation strategy outlined here is the first strategy with measurable targets for adaptation to the impacts of climate change within the scope of responsibilities and competences of the German government, as required by section 3 of the Federal Climate Adaptation Act. As stipulated in section 1 of the Act, the strategy contributes to preserving equivalent living conditions by increasing the resilience and robustness of ecological systems, the economy and society to better withstand the effects of climate change both now and in future.

Section 1 of the strategy highlights the strategy's context and development process and the governance of climate adaptation in Germany. It also puts the German Strategy for Adaptation to Climate Change (DAS) in the context of national, European and international strategies and goals. Section 2 presents the results of the 2023 monitoring report for the

strategy and the 2021 climate impact and risk analysis for Germany (KWRA 2021). The measurable targets for climate adaptation, along with the associated indicators and measures that contribute to achieving them, are summarised in section 3 in different cluster categories. In addition to the specific cluster-related targets, the German government addresses other issues relevant to comprehensive precautionary climate adaptation in action areas, which are also outlined in section 3. Section 4 highlights the main mechanisms for guiding and implementing the strategy. Detailed background documents from the ministries for each cluster can be found in Annex 1 (cluster documents) and form the basis for the summary in section 3. Annex 2 contains the fourth Adaptation Action Plan (APA IV), which provides an overview of the German government's climate adaptation measures. In addition to the measures to achieve the targets set out in the clusters, the APA IV also includes further climate adaptation measures from the federal ministries.

The targets, including the associated indicators, instruments and measures, are divided into various action areas, which are grouped into the following seven clusters: **infrastructure;**

**land and land use; human health and care provision; urban development, spatial planning and civil protection; water; economy;** and a cluster of cross-sectoral issues. The targets address priority areas of climate adaptation that fall within the remit of the federal government. They focus primarily on the climate impacts identified in the KWRA 2021 that require particularly urgent action. These include climate risks from high temperatures and the change in natural systems and resources, particularly for human health, climate risks from drought, particularly for all systems that use or depend on water, climate risks from rainstorms, flash flooding, high water levels and fluvial floods, especially for soil, infrastructure and buildings, as well as climate risks from the gradual rise in temperature and sea levels. Progress towards the targets will be measured by an indicator-based monitoring system.

Cooperation between ministries takes place in the Interministerial Working Group on Adaptation to Climate Change (IMAA), under the lead responsibility of the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV).

The IMAA is supported by the *Behördennetzwerk Klimafolgen und Anpassung*, a government agency network focusing on climate impacts and adaptation, which is headed up by the German Environment Agency (UBA). This network provides the scientific basis for the strategy documents and reports on the precautionary climate adaptation strategy. Within this framework, 28 higher federal authorities work together on climate adaptation, in particular on

monitoring climate impacts and adaptation, as well as on the assessment of risks, policy instruments and measures.

Cooperation within the IMAA also ensures that the climate adaptation strategy is aligned with other strategies of the federal government, including the National Water Strategy, the Peatland Protection Strategy, the National Sustainable Development Strategy, the Onshore Wind Energy Strategy and the German Strategy for Strengthening Resilience to Disasters. For the adaptation measures to be implemented effectively, it is essential that all levels of government work not only together but also with non-governmental stakeholders. The federal and state governments are working closely together within the framework of the Conference of German Environment Ministers (UMK), the Federal-State Working Group on Climate, Energy, Mobility and Sustainability (BLAG KliNa) and the Standing Committee on Adaptation to the Consequences of Climate Change (StA AFK).

The IMAA developed the precautionary climate adaptation strategy with measurable targets in a broad-based collaborative and participatory process. Representatives of federal states, associations, including municipal umbrella organisations, and the scientific community were extensively involved. At the same time, local residents in five regions of Germany that are affected differently by climate change formulated ideas and recommendations on how to ensure a liveable future despite climate change. The results of the participatory process were reviewed by the cluster-specific interministerial working groups and incorporated into the development of the new climate adaptation strategy.

It is important that the strategy presented here does not create any additional bureaucratic hurdles for individuals or companies. Any additional requirements for human and material resources arising for the federal government from the strategy must be fully funded in the long term from the relevant individual ministry budgets or special fund as part of applicable budget and financial planning.

In the **infrastructure** cluster, this strategy deals with two action areas. In the **transport and transport infrastructure** action area, the German government aims to make transport systems more resilient to the impacts of climate change. To this end, transport and logistics conditions on federal waterways must be optimised by 2030-2040 to ensure rivers remain navigable when water levels are low. In addition, we aim to reduce the damage and number of disruptions to road and rail transport caused by weather-related factors by 2050. In the **infrastructure** cluster, the aim of the **buildings** action area is to adapt buildings and properties to protect users and, in particular, to make existing buildings more resilient by 2030–2050 through precautionary structural measures.

This will also help reduce financial risks caused by the impacts of climate change.

The **land and land use** cluster consists of four action areas with closely related targets.

In the **biodiversity** action area, the German government aims to minimise the direct and indirect impacts of climate change on biodiversity by 2030. In the **soil** action area, the resilience of soil to the impacts of climate change will be improved, for example, by reducing land take to less than 30 hectares per day as well as new soil sealing by 2030. The German government has set two targets under the **agriculture** action area: first, agroecosystems must become resilient to the impacts of climate change; sustainable, locally adapted management and structures must contribute to a diverse range of biotopes and structures, as well as to biodiversity in agricultural landscapes and a climate-resilient land-use system, and to stable production of agricultural raw materials. Second, farms need to become resilient enough to withstand climate variability and adverse weather conditions while also being able to sustainably produce sufficient high-quality food and animal feed as well as bio-based raw materials, even under challenging climate conditions. The interactions between the **soil** and **agriculture** action areas are dealt with in several joint sub-targets, which address the carbon storage function and soil humus, peat soils, crop diversity, permanent grassland, erosion protection, harmful soil compaction and structural and landscape elements that promote biodiversity. For the **woodlands and forestry** action area, the goal is to achieve climate-resilient and locally adapted forests and adaptive, near-natural and sustainable forest management, making forests adaptable to climate change and resilient to climate variability and adverse weather conditions, and to ensure favourable conditions for the preservation of their functionality through their high biodiversity.

In the **human health and care provision** cluster, the German government aims to strengthen the public's ability to adapt to heat and ultraviolet rays by 2030. This approach will improve both individual behaviour and preventative structures, in other words, the general conditions in municipalities and healthcare facilities. At the same time, we want to strengthen the public's ability to deal with pollen allergies and prevent infectious diseases facilitated by climate change, particularly vector-borne diseases (whose pathogens are transmitted by vectors such as mosquitoes or ticks) by 2030.

The **urban development, spatial planning and civil protection** cluster is comprised of the three action areas: one of the targets in the **urban and settlement development** action area is to activate urban green spaces to reduce heat stress. Furthermore, the aim is to work towards a natural water balance for water-smart urban development to minimise the risks posed by heavy rain and drought, as well as to activate evaporation cooling. In the **spatial planning** action area, the German government aims to develop and introduce climate adaptation monitoring (ex-post) for spatial development plans at the federal state and regional level by 2026, and to improve how future climate change impacts are taken into

account when drawing up and updating spatial plans at the federal state and regional level by 2028. The **civil protection and disaster response** action area comprises three further targets in this cluster: to expand the reach of warnings to the general public and increase the level of public information and preparedness on the risks associated with climate change, in particular extreme weather events. Furthermore, the aim is to raise the visibility and attractiveness of volunteering in civil protection.

In the **water** cluster, the action areas of **water balance and water management, including flood risk, low water risk and rainstorm risk management, coastal and marine protection** and **fisheries** are addressed in three joint targets. The first aim is to continue to ensure a sufficient supply of high-quality water for humans and nature, and for people's social and economic activities. The second aim is to strengthen the resilience of the water infrastructure. The goal is to design infrastructure that can be adapted with the least possible effort to evolving conditions such as climate change, new demands from the public for higher ecological standards or the changing water needs of users. Wherever possible, infrastructure will be designed as a nature-based solution, harnessing the potential of interconnected water, energy and material cycles and networked at the appropriate inter-municipal level. The third target concerns the ecology of water bodies and aims to promote climate-resilient bodies of water, for example by improving and restoring the natural state of water body structures and stabilising water temperatures. For the **fisheries** action area, the aim under European legislation is to manage all fish stocks sustainably at levels that produce the optimal sustainable yield.

In the **economy** cluster, the German government aims to establish a climate-resilient economy over the medium term. This means that all economic decisions will take the impacts of climate change into strategic consideration, and all stakeholders at all levels will ensure comprehensive adaptation to the unavoidable impacts of climate change. Analysing the physical climate risks will need to become an integral part of risk management and corporate investment decisions. Another target is to ensure that extreme weather events no longer lead to significant losses due to their impacts on staff and corporate assets of companies in Germany. Furthermore, German companies should be able to operate successfully on national and international markets with technologies and services in the context of climate adaptation and continuously increase their aggregated added value in line with the trend.

The **cross-sectoral action area** cluster addresses systemic needs for action and the general conditions for precautionary climate adaptation. In the area of municipal adaptation planning, the target is for climate adaptation plans to be in place for 80 percent of the municipalities and districts required to do so by the federal states by 2030 under section 12

(1) of the Federal Climate Adaptation Act. In addition, the government plans to survey federal expenditure on climate adaptation every two years starting in 2026 and to collect data on the amount of damage caused by extreme weather events. In addition, the natural hazards portal of the German Weather Service will be set up as a central information source to make this data available to the public. In the area of research, the aim is faster implementation of research findings on climate adaptation by involving more users of this research as partners in projects and by increasing the number of practitioners in research projects by 20 percentage points by 2040 (reference period: 2022-2024). In addition, at least 20 research-based products will be established in practice by 2030. Furthermore, the German government will establish a national framework with indicators and measures so that the UNESCO World Heritage sites in Germany can develop climate change mitigation measures and/or climate adaptation strategies or plans by 2030. To adapt federal properties to climate change, the German government aims to present management plans for 100,000 hectares of federal forest land by 2033, with climate adaptation measures in the form of forest management plans. By 2027, it also plans to conduct inspections of all civilian properties to determine their capacity to withstand heavy rainfall.

In addition to the specific cluster-related targets, the German government will address other issues relevant to comprehensive precautionary climate action in a number of action areas, for which targets could be developed in future. The action areas include social justice and vulnerable groups, occupational safety, the availability of digital data, personal and financial security, education and sport.

The targets and measures set out for the first time in this strategy will be reviewed every four years and, if necessary, further developed or adapted. The next strategy monitoring report is scheduled for publication in 2027, and will serve as the basis for the German government's first assessment of progress towards the targets. In 2028, an updated climate risk analysis will also be presented as a basis for further strategy development. It will examine the possible future impacts of climate change in Germany, assess the associated climate risks, identify the areas where action is urgently needed and estimate the effectiveness of adaptation options for risk reduction. Both products – the strategy monitoring report and the climate risk analysis – essentially form the basis for updating this strategy.