



# **MAX PLANCK** **CLIMATE** **ACTION PLAN**

VERSION FROM FEBRUARY 21, 2024

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The MPG intends to operate climate-neutrally by 2035 at the latest. The present *Climate Action Plan*, which is being continuously developed, serves this purpose.



# Introduction

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The climate crisis caused by human-made global warming poses the greatest challenge for humankind in the 21st century. The Max Planck Society (MPG) meets this challenge in two ways. On the one hand, it contributes to understanding the climate crisis through a wide range of research activities, making predictions for the further development of the Earth system and humankind and identifying technical and social approaches to mitigate it. On the other hand, the MPG also intends to play a pioneering role in reducing greenhouse gas emissions and has committed itself to working in a climate-neutral manner by 2035 at the latest. The present Climate Action Plan defines measures to achieve this target, sets out how they are to be implemented and is being continuously developed.

Climate protection is inconceivable without research. The MPG's findings-driven research creates new knowledge and makes important contributions to the fundamental scientific understanding of anthropogenic climate change, showing ways to mitigate it and to achieve tangible sustainable development. It provides fundamental knowledge about climate change and shares this knowledge with the world of politics and society. With its contributions to energy research, among other things, the MPG shows innovative ways in which a future worth living on the planet can be shaped.

The MPG's research is committed to the benefit of humankind and thus also to the protection of the environment.<sup>1</sup> Avoiding or reducing harm to people and the environment is part of the MPG's self-image. Even today, the MPG endeavours to conduct research in the most resource- and climate-friendly way possible and thus – in addition to its fundamental scientific contributions – also provides contributions to sustainability and climate protection in its operation, for example in the areas of building and mobility. The MPG does this without jeopardizing or questioning the foundations of its successful activities and the expectations placed on the quality of its research, and in full awareness of the actual effects and limits of these actions.

The MPG's actions are guided by the international targets for combating global warming. Accordingly, in a statement issued by the Alliance of Science Organizations on 13 September 2021, the MPG “emphatically committed itself to achieving climate neutrality in its working methods and research processes by 2035 at the latest.” In this context, the MPG is convinced that climate-friendly research operations cannot be achieved at the expense of scientific performance, but rather in conjunction with it.

On taking office in June 2023, the President of the MPG, Prof. Patrick Cramer, declared: *“We want to make our contribution to climate protection. We will develop a sustainability concept to make the Max Planck Society climate-neutral by 2035 at the latest.”*

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<sup>1</sup> Cf. “Max Planck Society Notes and Rules on Dealing Responsibly with Freedom of Research and Research Risks”, adopted by the Senate of the Max Planck Society on 19 March 2010 after approval by the Scientific Council, updated on 17 March 2017.



# 1. Target: Climate-neutral research operations

On 27 September 2023, the MPG committed itself to a mission statement by resolution of the Perspective Council:

*The Max Planck Society is committed to contributing to a future worth living in, both through its research and its practical actions. It wants to be a role model for how research can be conducted responsibly, sustainably and in a climate-friendly manner.*

This was preceded by a resolution of the Scientific Council dated 20 February 2020, which states that:

*“The Members of the Scientific Council of the Max Planck Society consider climate protection to be an outstandingly important social concern. Every organization and every individual is called upon to gear their actions along these lines. This also applies to the Max Planck Society. The Members of the Scientific Council therefore ask Administrative Headquarters to ensure as quickly as possible that the Max Planck Society makes an ambitious and clearly visible contribution to climate protection.”*

In addition, the MPG is specifically committed to the target of achieving climate neutrality in research operations by 2035.

To achieve this target, the MPG takes the following steps:  
The MPG

- provides an evidence-based foundation for possible paths towards the target of climate neutrality,
- formulates target figures for achieving climate neutrality in all areas of the organization's activities,
- aligns the research and administrative activities at its Institutes with the principle of “avoidance before reduction before compensation [of greenhouse gas emissions]” in order to conserve and protect natural resources,
- provides the human and financial resources required for climate protection, and
- establishes a stable organization and communication (internal/external) of the process towards climate neutrality.

In this context, the MPG is guided by the conviction

- that the efficient use of energy and the avoidance of climate-damaging emissions free up potential for innovation and progress,
- that sustainability and climate protection are characteristics and the organizational basis of a modern research organization attractive to the best talent,
- that the transformation towards climate-neutral research operations requires not only new technologies, but also changes both on the individual and on the social level, as well as appropriate political decisions and incentive systems, and
- that research operations without fossil energy sources require higher initial financial investments, but are more future-proof overall in the long term, also from an economic perspective.



## 2. Initial situation

The approach towards a climate strategy or climate plan for the MPG can be compared “to building a house, where the level of detail in the concept and project planning increases continuously as the planning progresses.”<sup>2</sup>

In line with the *Greenhouse Gas Protocol*, MPG emissions are differentiated into what is referred to as Scopes. In this context, **Scope 1** comprises the **direct release of climate-damaging gases within the own organization** (combustion in stationary plants, vehicle fleet and fugitive gases), **Scope 2** the **indirect emissions from the purchase of grid-bound energy** (electricity, water steam, district heating or cooling) and **Scope 3** the **indirect emissions from the upstream and downstream supply chain**.

The knowledge of the MPG’s greenhouse gas footprint is currently fragmentary and can only be roughly estimated based on greenhouse gas analyses of selected MPIs, on the one hand, and on an analysis of selected global data, on the other. The base year for the calculation of greenhouse gas equivalents<sup>3</sup> is 2019:

- Data for **natural gas**<sup>4</sup> (Scope 1, approx. 114.7 GWh, corresponding to approx. **21,000 tons of CO<sub>2</sub>eq**<sup>5</sup>) and **electricity**<sup>6</sup> (Scope 2, approx. 285 GWh, corresponding to approx. **119,000 tons of CO<sub>2</sub>eq**<sup>7</sup> according to the location-based approach with the German electricity mix and approx. **80,000 tons of CO<sub>2</sub>-eq**<sup>8</sup> according to the market-based approach with the emission factor of the energy supplier) is available from the Central Purchasing Department for 2019, although not all facilities are included here.<sup>9</sup>
- Data for **air travel** (Scope 3) can be taken from the Online Travel Booking System (ORBS [*Online-Reisebuchungssystem*]).<sup>10</sup> For 2019, the figure was approx. **25,000 tons of CO<sub>2</sub>eq**.

There is currently no reliable data available on other energy sources, such as heating oil and district heating. There is also no MPG-wide data available for waste, water consumption and the purchase of goods, etc. Furthermore, the greenhouse gas analysis does not include the entire area of buildings and construction.

Nevertheless, numerous specific steps towards climate neutrality can be planned and already taken in line with the approach outlined above. The *Climate Action Plan* gives priority to the main sources of emissions, which are to be reduced quickly through savings and more efficient utilization as well as investment measures in climate-friendly technologies.

<sup>2</sup> President at the 18th meeting of the Presidential Committee “Climate Protection in the MPG” on 18 July 2023.

<sup>3</sup> Greenhouse gas equivalents include carbon dioxide (CO<sub>2</sub>, as a reference value), methane (CH<sub>4</sub>), nitrous oxide (laughing gas, N<sub>2</sub>O), hydrofluorocarbons (HFCs/HFCs), perfluorocarbons (HFCs/PFCs), sulphur hexafluoride (SF<sub>6</sub>) and nitrogen trifluoride (NF<sub>3</sub>).

<sup>4</sup> 50 consumption points are recorded by the Central Purchasing Department.

<sup>5</sup> On the recommendation of Environment Agency of the German government (Umweltbundesamt) for natural gas heating value (Hi) emission factor 181.935 g CO<sub>2</sub>/kWh, p. 49:

[https://www.umweltbundesamt.de/sites/default/files/medien/479/publikationen/cc\\_28-2022\\_emissionsfaktoren-brennstoffe\\_bf.pdf](https://www.umweltbundesamt.de/sites/default/files/medien/479/publikationen/cc_28-2022_emissionsfaktoren-brennstoffe_bf.pdf)

<sup>6</sup> 216 consumption points are recorded by the Central Purchasing Department – without IPP, MPCDE, MPA and MPE.

<sup>7</sup> Location-based approach: On the recommendation of the Environment Agency of the German government for electricity emission factor 418 g CO<sub>2</sub> equivalents/kWh (without upstream chains) for 2019, p. 11: [https://www.umweltbundesamt.de/sites/default/files/medien/1410/publikationen/2023\\_05\\_23\\_climate\\_change\\_20-2023\\_strommix\\_bf.pdf](https://www.umweltbundesamt.de/sites/default/files/medien/1410/publikationen/2023_05_23_climate_change_20-2023_strommix_bf.pdf)

<sup>8</sup> Market-based approach: Emissions of the electricity product “Remaining energy source mix” from the 2019 electricity label at 282 g CO<sub>2</sub>/kWh. Note: Emission factor of the current supplier, at that time there were other suppliers in addition to this one.

<sup>9</sup> Tons of CO<sub>2</sub>eq in Scopes 1 and 2 without the emissions from the upstream chain from energy supply, which are separately accounted for in Scope 3.

<sup>10</sup> Trips that are not booked via ORBS or directly via the travel agency are not included here.



## 3. Intermediate target: Halving emissions by 2029

Against the backdrop of the targeted climate neutrality, the MPG will reduce its greenhouse gas emissions in the areas of **Scope 1 (natural gas) and Scope 2 (electricity) significantly by 2029 compared to the base year 2019**.<sup>11</sup> This means that except for district heating, which cannot initially be recorded due to a lack of data, the most significant sources of emissions at the MPG are included in this area. Concerning district heating, it should be noted that this can already be regarded as a contemporary source of heat and that the reduction of the associated emissions is dependent on municipal heating planning in addition to direct savings. For the future heat supply, regionally available renewable energy sources such as geothermal energy and locally available waste heat should be given preference and implemented particularly in district and campus concepts, e.g. via heat pumps or, where economically promising, also via deep drilling. This will be accompanied by the energy-efficient renovation of existing buildings, i.e. upgrading the building envelope and switching to low-temperature heating systems. Both aspects will lead to a significant reduction in energy consumption for building operation and the elimination of fossil gas as heating energy, particularly in the medium term (due to the long planning horizons for construction and renovation).

The **introduction of energy management systems** including the associated continuous improvement process (CIP) as part of the implementation of the Energy Efficiency Act [*EnEFG – Energieeffizienzgesetz*], should make a significant contribution to the systematic reduction of energy consumption. For the next central electricity procurement session at the latest, the entire electricity requirement in excess of the electricity generated in-house is aimed to be covered with **100 percent green electricity** (outside the EEG levy). In order to purchase green electricity, it will be necessary to introduce energy and load profile management.

In the area of indirect **Scope 3 emissions**, the MPG focuses on **business travel**, as this is where the greatest CO<sub>2</sub> emissions are generated. In particular, the avoidance of short-haul flights and the Guideline for a climate-friendly mobility culture should lead to savings here. In addition, the employer subsidy for local public transport has been in place since 2022 to make its use more attractive and thus **commuting** more climate-friendly. The local “Job-Ticket” and the “DeutschlandJobTicket” (DJT) are subsidized.

In total, **emissions should be at least halved by 2029**. As the target is stated in percent, it will be possible to put this reduction path on a broader data basis in future. Among other things, a mobility survey is planned in the MPG for this purpose.

Suitable framework conditions, such as the energy, heating and mobility transition with corresponding public infrastructures, are a necessary prerequisite for the envisaged reduction targets. The MPG will also advocate further development towards greater sustainability with regard to funding law. The reduction targets are to be implemented, hand in hand with the local initiatives of the sustainability committees, through the measures described below.

<sup>11</sup> Only the data available at the Central Purchasing Department can be used for the Scopes 1 and 2, so the targets apply to the purchase of natural gas and electricity consumption without the upstream chain emissions in Scope 3.



## 4. Target tables with measures by Scope and time horizon

In the area of **Scope 1 emissions**, the MPG is already well positioned owing to the district heating supply available at many MPIs and its prospective development. Central refurbishment programs are intended to support the often complex requirements for the **refurbishment of existing properties with regard to the building envelope and heating**.

MPG is also well on the way to implementing the Act on the Procurement of Clean Road Vehicles [*Gesetz über die Beschaffung sauberer Straßenfahrzeuge – SaubFahrzeug-BeschG*] for its **vehicle fleet**. The procurement of leased vehicles clearly exceeds the required quota of 38.5 per cent low-emission vehicles.

ACTION PLAN SCOPE 1	Time horizon
Against the backdrop of the Clean Vehicles Procurement Act [ <i>SaubFahrzeugBeschG</i> ], <b>charging points</b> are being installed and the <b>vehicle fleet is being converted to clean drive systems</b> .	Established
The <b>formation of networks at the Institutes in the course of energy monitoring for energy-saving measures</b> is to be coordinated by Administrative Headquarters to implement best practice measures at other institutes as well. The networks are modelled on the energy efficiency networks already established in industry.	Short term
To monitor CO <sub>2</sub> emissions and the obligatory savings obligations from the Energy Efficiency Act [ <i>Energieeffizienzgesetz – EnEfG</i> ], a <b>central data management system will be set up to collect relevant energy and environmental indicators</b> for the entire MPG, based on the data from the individual institutes. Against the backdrop of climate neutrality and the obligations to save energy under the EnEfG, regular <b>monitoring</b> of these data and a reporting routine for the MPG Management and the scientific Sections will be established.	Short term
In addition to the networking of the Institutes, central <b>refurbishment programmes</b> are to be set up, for example for the heating sector, strategically aiming towards the legal requirements of the Building Energy Act [ <i>GEG – Gebäudeenergiegesetz</i> ] and Energy Efficiency Act [ <i>EnEfG</i> ] as well as the Federal Government's Programme of Measures for Sustainability [ <i>MPN – Maßnahmenprogramm Nachhaltigkeit</i> ]. The focus should be on a CO <sub>2</sub> -free heat supply with regionally available renewable heat sources (e.g. geothermal energy, waste heat) and on centralized supply via heating networks as well as on the cascade use of heat.	t.b.d.



For **Scope 2**, regarding the procurement of grid-bound energy, the MPG is focussing on **saving and efficiently using electricity**, also as part of the implementation of the EnEfG; in addition, the **procurement of green electricity** will be implemented as soon as possible. In the long term, there are also plans to **generate our own electricity and storage** of

surplus energies on a larger scale and with scientific support based on cooperation projects with energy providers.

The **“Max Planck Solar”** programme launched by the President, which promotes the installation of photovoltaic systems at the MPIs, is already in operation.

ACTION PLAN SCOPE 2	Time horizon
A list of <b>immediate measures</b> was published on the MAX intranet in the wake of the energy crisis, as well as specific <b>best practice examples for saving energy</b> , such as in laboratory operations.	Established
On taking office, the President launched the <b>“Max Planck Solar”</b> programme promoting the installation of photovoltaic systems at the MPIs – 31 applications have already been implemented in the first round in 2023 (possibly renewed calls for tenders and initiatives in 2024).	Established
Electricity consumption: Once the current electricity contracts expire, the changeover to <b>100 percent green electricity</b> (outside the EEG levy) will take place. It is also being examined whether an early changeover is possible and feasible in terms of sensible “greening”.	t.b.d.
In addition, innovative <b>concepts for self-generated electricity and for storing</b> surplus energy from renewable energies (Power to X) are being developed in co-operation with energy providers and with scientific support.	Long term and supportive

The indirect emissions from the upstream and downstream supply chain in **Scope 3** vary greatly also in the MPG, depending on the MPI and are very diverse overall. Under the criterion of materiality, the MPG is focussing here on the area of **mobility**. On the one hand, a guideline is intended to contribute to this; on the other hand, the current air travel monitoring, presently accompanied by two compensation projects, will be used as a basis.

For the **compensation** of air travel emissions, the MPG is currently working with the renowned non-profit cooperation partner **“atmosfair gGmbH”**. Compensation is based on what is referred to as the “contribution claim” model which allows the compensation effect to be recognized in the project country to avoid double counting.

The funds are currently flowing into two projects. On the one hand, in a project for the **construction of brick kilns** for sustainable brick production in Malawi. On the other hand, in a project promoting the development of an infrastructure for the

carbonization (biochar production in a pyrolysis plant) of local wood from small farms in Tanzania and the introduction of this **biochar** into local soils, where it leads to an improvement in soil quality and yield. The MPG is actively looking for compensation projects, possibly with scientific support, to ensure that carbon remains in the biosphere or geosphere and does not return to the atmosphere.

Research will always require a minimum of air travel because it is organized globally (field research, conferences, cooperation endeavours). In order to raise even greater awareness of the issue, the MPG will create an **incentive system for reducing air travel**, taking into account specific research needs. The committees of the MPG will deal with this in future, including the question of whether **short-haul flights** should be limited to justified exceptions such as rail strikes.

In order to make **commuting** more climate-friendly, the “Job-ticket” was introduced in 2022 and the “DeutschlandJobTicket” in 2023.



Further measures in Scope 3 include the subjects of **circular economy, communication, a guideline on sustainable building**, which will subsequently also contribute to the operation of

the buildings, as well as a **brochure on biodiversity**, which presents successful projects at MPIs, thus encouraging the implementation of further initiatives.

ACTION PLAN SCOPE 3	Time horizon
MPG as an employer has been subsidizing the <b>"Job Ticket"</b> since 2022 and the <b>"DeutschlandJobTicket"</b> (DJT) since 2023.	Established
Since 2023, all employees have been able to access a <b>device exchange</b> via the intranet, which allows them to extend the useful life of devices by simply and directly finding and exchanging used devices.	Established
The <b>intranet site "Sustainability in the MPG"</b> has already become established, providing not only new employees with information on the existing sustainability structures, possible immediate measures, and other sustainability-related topics, from procurement to best practice examples in the areas of waste disposal and energy saving.	Established
As far as <b>business air travel</b> is concerned, we already cooperate with the non-profit organization atmos-fair gGmbH. The facilities and Institutes of the MPG receive quarterly evaluations of their travel routes and the associated emissions. Based on this calculation, 30 euros per ton of CO <sub>2</sub> equivalent emitted is used for climate protection projects. <sup>12</sup> The funds currently flow into two climate protection projects in accordance with the contribution claim model.	Established
Air travel compensation is flanked by the <b>Guideline for a climate-friendly mobility culture in science</b> [ <i>Leitfaden für eine klimafreundliche Mobilitätskultur in der Wissenschaft</i> ]. This Guideline aims to limit CO <sub>2</sub> emissions in the very short term with the help of a climate-friendly scientific mobility culture. The measures and concepts listed in the Guideline are intended to limit CO <sub>2</sub> emissions by raising awareness of the value of travel for science, avoiding short-haul flights, using rail and public transport and, last but not least, reflecting on the benefits of conscious travel behaviour by saving time and resources as well as a virtually greater range and diversity in networking. Furthermore, an incentive system for avoiding flights and a policy for short-haul flights are to be established.	Short term
In future, new buildings will be constructed in accordance with the <b>Assessment System for Sustainable Building</b> [ <i>Bewertungssystem Nachhaltiges Bauen – BNB</i> ]	t.b.d.
The existing themed websites, for example on climate and energy, are intended to make an even greater contribution to the communication and networking of relevant activities.	t.b.d.
The construction industry has a dual key function in achieving the climate targets, both because of the consumption of resources during construction and renovation and in the utilization phase of buildings owing to the energy consumption for operation. A <b>"Guideline for sustainable building"</b> , which is currently being developed, is intended to provide guidance on how to make the MPG's building measures more climate-friendly and sustainable.	t.b.d.

<sup>12</sup> The price for a ton of CO<sub>2</sub> emitted in Germany was EUR 30 per ton in 2023 and has been raised to EUR 45 per ton for 2024.





## 5. Implementation

The President is advised by the Presidential Committee “Climate Protection in the MPG”, chaired by Prof. Tobias Bonhoeffer, Director at the Max Planck Institute for Biological Intelligence. This Committee develops recommendations on how climate protection and sustainability can be implemented as rapidly and effectively as possible in the MPG’s research operations. In addition to recording and evaluating business air travel, for which a climate protection contribution has been made since 2022, the Presidential Committee recommended the consistent establishment of local sustainability committees at all sites, which involve all relevant people at the Institute to define fields of action and effective targets for their sites.

There are also volunteer sustainability groups at numerous Institutes, which joined forces in the Max Planck Sustainability Network (MPSN) in 2019. In 2021, the MPSN published a “Catalogue of Recommendations (CaRe)”<sup>13</sup> with measures for greater sustainability at the MPIs and organizes regular meetings and training sessions.

At Administrative Headquarters, the Climate Action Plan Task Force, headed by Dr. Neizert, is responsible for designing and implementing the climate strategy. The tasks include the introduction of climate management in cooperation with the relevant Departments. The team<sup>14</sup> coordinates the climate protection measures and informs Management about their status. It is responsible for collecting and monitoring energy and environmental indicators and organizes internal and external communication together with the Communications Department.<sup>15</sup>

Beyond the specific measures in Scope 1 to Scope 3, the MPG is committed to the further development of **funding legislation** to embed the explicit mention of the **aspects of sustainability, environmental compatibility and climate protection** as new and supplementary principles of action.

Furthermore, the necessary equality of **funding options by the Federal States for new construction and refurbishment** is to be discussed with the Joint Science Conference (GWK).

To bundle the aforementioned sustainability activities, a **reporting system** for centralized and decentralized measures and corresponding key figures will be established.

Last but not least, a **member of the extended Presidential Council with responsibility** for the subject of sustainability was appointed as a driving force.

Climate protection is already embedded centrally and decentrally as a cross-cutting issue in the governance of the MPG. The people in the MPG are essential to the success of the Climate Action Plan presented here. The MPG **Management level** is therefore working towards a widely embedded climate protection and sustainability culture in parallel to the specific measures mentioned here.

<sup>13</sup> <https://owncloud.gwdg.de/index.php/s/3gSwu8jolI8IznP>

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<sup>15</sup> Further contact persons, in particular from the **Procurement, Building, Legal, Human Resource Development, Travel Organization, Communications, and Institutes Departments** will be involved in the future.