MAX PLANCK
GESELLSCHAFT

GUIDELINES
FOR SUSTAINABLE PLANNING AND BUILDING

LAST UPDATED A PRIL 2025

Part A – Overarching Objectives and Principles

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1. Objective

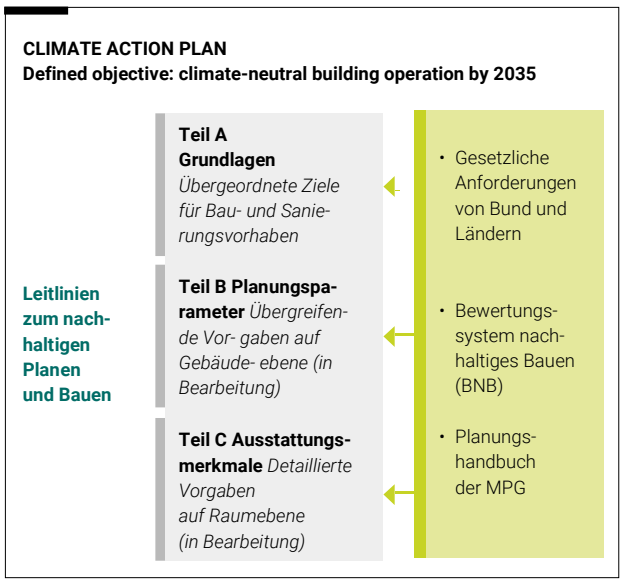
The Federal Climate Protection Act (Bundes-Klimaschutzgesetz – KSG) sets out Germany's path to climate neutrality. According to its provisions, Germany is to reduce its greenhouse gas emissions by 65 per cent compared to 1990 by the end of the decade.

The Max Planck Society (MPG) aims to achieve climate neutrality in its research operations by 2035.

The MPG maintains properties for basic research for 85 Institutes and facilities in Germany and other European countries. Particularly in the construction and operation of these properties owned by the MPG, there is potential for reducing greenhouse gas emissions, saving energy and improving energy efficiency. The motivation behind the creation of these Guidelines is the public sector's role model status for climate-friendly construction, the increasing legal requirements for federal properties, and the climate neutrality targets already in place for 2035 in some cities and municipalities.

As a rule, climate activities are associated with financing requirements, besides potential savings in operations. In all endeavours undertaken by the MPG, it is essential to ensure the participation of all individuals concerned. After all, embracing greater sustainability necessitates change in numerous areas and habits.

The CAP (Climate Action Plan) governs the overarching sustainability objectives of the MPG and is to be complied with.



The Max Planck Society's Guidelines for Sustainable Planning and Building define the overarching objectives for the MPG's building and refurbishment projects – Part A – which are to be adhered to as a contribution to climate protection. Parts B (Planning Parameters) and C (Equipment Features) are particularly aimed at the Research Building and Infrastructure Department, as well as all other parties involved in the planning of our building projects.

The MPG's Guidelines for Sustainable Planning and Building establish a binding framework for climate-friendly action when implementing all new buildings, refurbishments and conversions. In this context, it is also important to remember that "cost-effectiveness" is not just about the manufacturing costs, but rather the total costs over the whole life cycle. These Guidelines do not replace professional, functional and comprehensive project planning.

The available natural resources should be used in the best possible way, with careful withdrawal, efficient use and the avoidance of environmental pollution being taken into account!

The Guidelines aim to minimize total annual costs (the sum of capital, operating and follow-up costs) throughout the properties' entire life cycle (planning, construction, operation, refurbishment, dismantling and disposal), while maintaining predetermined quality standards for sustainable construction and climate-neutral research operations. It is generally assumed that a complete life cycle is 50 years.

The guidelines put the people who use the building at the centre, with the aim of promoting their well-being. Last but not least, the aim is to support the appropriate design of new buildings, the preservation of high-quality buildings, and the sustainable planning, execution and efficient use of buildings and energy.

Since 1 January 2023, the MPG has been required to certify building projects with a net construction cost of €2 million or more using the BNB Silver rating system, where possible. The existing model target agreement forms the basis of all projects and must be updated during the preliminary planning stage jointly with the BNB expert and other parties involved in the construction. It should also be adapted as necessary to address project-specific issues.

The objectives of certification are to provide evidence of the construction of sustainable buildings and their contribution to achieving overarching climate protection targets.

The Guidelines should be applied mutatis mutandis to existing buildings and small building projects.

Leitlinien zum nachhaltigen Planen und Bauen	Guidelines for Sustainable Planning and Building
Teil A Grundlagen *Übergeordnete Ziele für Bau- und Sanierungsvorhaben*	Part A Fundamentals *Overarching objectives for building and refurbishment projects*
Teil B Planungsparameter *Übergreifende Vorgaben auf Gebäudeebene (in Bearbeitung)*	Part B Planning Parameters *Overarching requirements at building level (in progress)*
Teil C Ausstattungsmerkmale *Detaillierte Vorgaben auf Raumebene (in Bearbeitung)*	Part C Equipment features *Detailed requirements at room level (in progress)*
• Gesetzliche Anforderungen von Bund und Ländern	• Legal requirements of the Federal Government and its Federal States
• Bewertungssystem nachhaltiges Bauen (BNB)	• Assessment System for Sustainable Building (BNB)
• Planungshandbuch der MPG	• Planning Handbook of the MPG

2. Scope of application

These Guidelines are mandatory for all new construction and refurbishment projects undertaken by the Max Planck Society, as well as for all buildings constructed under other procurement models.

They do not imply any obligation to retrofit existing buildings. This is stipulated by legal requirements (e.g. in the Buildings Energy Act (Gebäudeenergiegesetz – GEG). These Guidelines do not apply to temporary structures with a useful life of up to five years, unless individual regulations explicitly refer to them.

Deviations may be permitted in individual cases, but only with the approval of the Research Building and Infrastructure Department and if an economic advantage can be proven by means of a total cost/life cycle cost calculation (cf. § 5 GEG). In this context, environmental follow-up costs should be used in accordance with the recommendation of the German Environment Agency regarding climate costs.

The following Guidelines, including their annexes, form part of the commissioning of all architectural and engineering firms within the framework of Major and Minor Building Measures, as well as building maintenance and other similar procurement measures.

Any deviations from the Guidelines for technical, economic and/or functional reasons must be reported at design planning stage at the latest. Written justification and approval by the Building Representatives (BBV – Baubevollmächtigte) / Project Management (Projektleitung – PL) is always required.

The Guidelines reflect the current state of the art, and are updated on a timely basis. As with other building regulations, the decisive factor is the status at the time of submitting the (internal) building application for new construction BewGr-MPG[1] No. 12(2) (Approval of the building application/application documents) and refurbishment BewGr-MPG No. 12(2)/12(3) (Approval of the commencement of construction/construction documents).

In addition, the legal requirements of the Federal Government and its Federal States must be observed, even if they conflict with this Guideline.

[1] Management Principles of the MPG

3. Principles of building in the MPG

3.1 General principles

The Management Principles of the MPG (BewGr-MPG) are to be complied with.

Particular emphasis should be placed on the change in how economic efficiency is viewed, as this forms the basis of all sustainable action. Investment costs are just one part of the total life cycle costs of a component or building, and are no longer the only reference point. In the future, operating, maintenance and replacement costs, as well as flexibility, redundancy and resource utilization, will also be assessed alongside economic efficiency in order to contribute to the achievement of climate protection goals. These factors are presented and recommended for implementation in the positive list.

Detailed information on planning is specified in the MPG internal documents Part B – Planning Parameters and Part C – Equipment Features and must be provably complied with.

The following particularly applies to new buildings, building extensions and refurbishments:

- Bringing together an integral planning team (developer, user representative, planner, expert, etc.) and creating variants for a needs-based and economical solution
- Planning cost-effective building designs
- Planning cost data must be adhered to; deviations must be justified.
- Space-saving planning and building (sufficiency)
- Compact and optimized building masses (typology according to use)
- Using economical axis dimensions and room depths that allow for subsequent changes to the floor plan
- Optimizing the floor plan to ensure maximum convertibility and retrofitting, including arranging building cores and shaft systems, reserving space for building services, reducing circulation areas, while taking into account the necessary material inputs
- Using renewable and recyclable raw materials and using secondary materials (recycled building materials) wherever possible
- Sourcing sustainable building materials (e.g. certified wood from sustainable forestry, avoiding long transport routes, etc.)
- Energy-efficient and easy to maintain in construction and operation
- The MPG's internal material ecology requirements based on the equipment features must always be complied with. This applies to planning, execution and technical building equipment.
- Choice of designs/materials with a low ecological footprint (grey emissions/grey energy)

3.2 Sufficiency – preservation of existing buildings / flexible concepts for use / durability

A fundamental step towards climate-friendly construction is to ensure sufficient planning that promotes the economical use of materials and energy, thereby saving resources and reducing emissions (e.g. CO_2 and other greenhouse gases).

When choosing a plot of land, preference should be given to developed sites over new developments on greenfield sites. This will help to avoid new sealing and additional land consumption.

There is great potential in the responsible management of existing properties and the reuse/further use of existing spaces and resources. This is where the greatest potential for conserving resources lies.

Therefore, refurbishment, conversion, extension or additional storeys, or partial use (e.g. retaining the basement and rebuilding with a timber construction), are preferable to complete demolition and replacement with a new building. Depending on the scientific requirements, a decision is made as part of a feasibility study that takes into account all the requirements for a further life cycle. These include an assessment of the building's condition, fulfilment of the space allocation plan and exploitation of the building right, among other things.

Resources can be used sparingly during the planning stage. For example, space efficiency can be achieved through multiple uses and stacking, as well as through flexible building structures that can be adapted for different uses. Resources can also be saved through simple and sustainable building designs. These are therefore preferable to complex and costly systems.

3. Principles of building in the MPG

3.3 Biodiversity and microclimate

The Max Planck Society is striving to implement greater biodiversity at its sites. In order to improve and promote biodiversity, the tree population should be preserved where possible and additional large tree locations should be created.

Urban, climate-adapted planning encompasses various aspects, including ventilation on one's own property and neighbouring buildings, improvement of the microclimate through greening (including building greening), (rain) water management (evaporation, infiltration, retention), minimization of sealed surfaces, and preservation and creation of natural shade, among other things. The aim is to coordinate and integrate ecosystem services and measures, such as rainwater retention and heat reduction, into the design in a holistic way.

Urban climate aspects must be taken into account when designing new buildings and open spaces (e.g. keeping cold air corridors clear, reducing surface sealing, using light-coloured surfaces and adding roof overhangs).

3.4 Climate and resource conservation, circularity

If it is not possible to preserve and continue using existing buildings, the aim should be to construct new buildings in the most climate-friendly and resource-efficient way possible, while encouraging recycling. In this context, the aspect of CO2 storage in the building components must also be considered. Notable measures include the increased use of timber construction and building materials made from renewable resources, as well as the use of secondary building materials and the reuse of components and building materials (e.g. reinforced concrete) from existing buildings. Furthermore, all designs must be geared towards circular construction, and thus optimized for dismantling, recycling and sorting by type. Using less material (for example, by optimizing spans to allow for thinner ceilings) also helps protect the climate and conserve resources.

3.5 Energy efficiency, refurbishment rates, TGA[2], renewable energies

As part of a holistic property development plan and with the appropriate resources, the rate of energetic refurbishment of the existing MPG building stock should be increased to at least 4.0 per cent annually in order to achieve climate-neutral research operations by 2035. To this end, specific refurbishment concepts must be developed for each Institute and campus.

The aim is to construct buildings that function fully with as little active technology as possible (efficient use of building technology: What do we really need?). Where local or district heating is unavailable, the use of renewable energies in the heat sector must be considered for all new and existing buildings, and implemented unless there are legal, technical, or usage-related reasons against it.
In addition to a compact and highly efficient building envelope and building services, the focus here is also on summer heat protection and preventing overheating, mainly through structural measures
(such as considering building orientation for high-tech areas (laboratories) versus areas with low technical equipment (offices), using passive solar energy in winter, using storage mass and night ventilation, and maintaining a moderate window area ratio). If active cooling in addition to passive measures is required (e.g. in laboratories), the use of renewable energy sources for cooling production should be examined and implemented where possible to meet the cooling energy demand.

3.6 Material ecology and indoor air hygiene

The use of low-emission, low-pollutant building materials aims to minimize risks to the local environment (soil, air and water) and to users' health. This means, among other things, avoiding biocides and substances of very high concern (such as sealants, adhesives and paints) wherever possible, limiting formaldehyde and VOC emissions, and using only WHO-approved, fibre-free building materials that come into contact with indoor air.

[2] Technical building equipment (TGA – Technische Gebäudeausrüstung)

3. Principles of building in the MPG

3.7 Accessibility

All buildings in publicly accessible areas that are constructed, extended and/or renovated must take accessibility into account. The accessibility concept must be developed during the preliminary planning stage, taking into account the internal working note on accessibility (see reference), and coordinated with the isability officers in the MPG and the MPIs.

3.8 Operation

According to the Statutes of the MPG, the Max Planck Institutes (MPIs) have sovereignty over the operation of the Institutes.

The following is considered necessary for preparing and implementing energy-efficient operations:

- Reducing the air exchange rate in accordance with individual safety and risk assessments adapted to the site
- Determining operating times
- Reducing representative areas to a minimum (reduction of operating costs)
- Preparing functional workplace concepts
- Implementing flexibly standardized laboratories
- Concepts for monitoring permanently sustainable operation
- etc.

The legal frameworks and requirements must be complied with.

Reporting obligations in accordance with EU taxonomy, amendments to the Energy Efficiency Act (Energieeffizienzgesetz – EnEfG) and the Building Energy Act (GEG), etc., as well as other current and future requirements, must be continuously reviewed and established on an overarching level.

The Max Planck Society's energy management (ISO 50001) lays the foundation for energy-efficient operations and serves as a basis for mandatory, MPG-wide reporting for the Energy Efficiency Act (EnEfG).

4. Implementation of the Guidelines

Compliance with the guidelines must be checked by the Technical Operations Manager on site using the relevant checklists (see annex) at four milestones (at the end of preliminary planning, for the budget documentation for construction by the project management, upon acceptance and in good time before the expiry of the warranty, but no later than after two and four years of operation).

Annexes:

- Part B - Planning Parameters (in progress)
- Part C - Equipment Features (in progress)
- Checklists for the implementation of the Guidelines (in progress)

Reference to internal documents:

- Working note on accessibility
- Model target agreement (in progress)
- Positive list

Designated annexes and internal documents are published in the project manual (project-specific) and thus made available to all project participants.