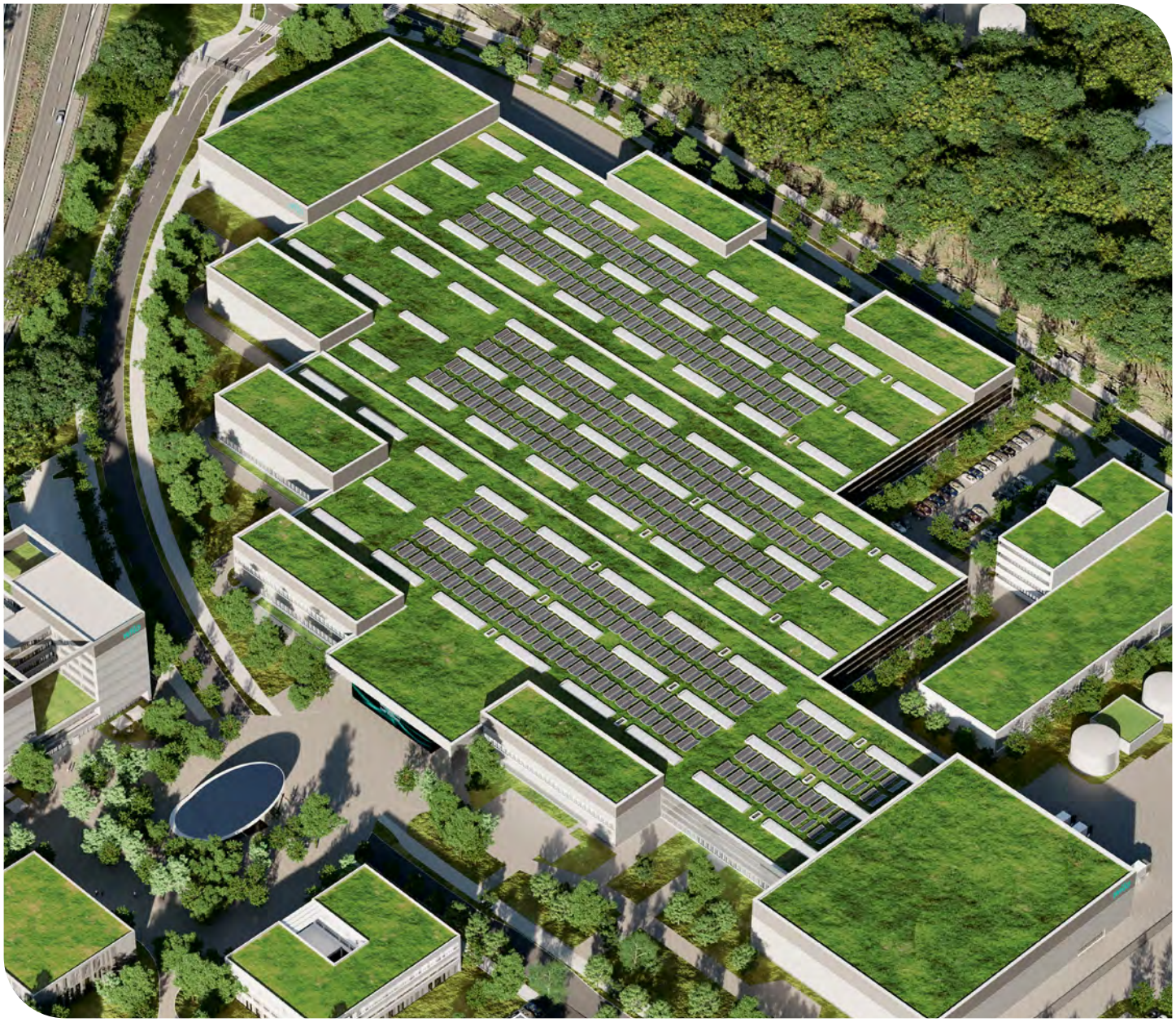
OPTIGRÜN®

MULTIFUNCTIONAL ROOF USE – OPTIGRÜN SOLAR & STORMWATER MANAGEMENT.



WHEN PHOTOVOLTAICS MEET GREEN ROOFS.

ECOLOGICALLY AND ECONOMICALLY IMPRESSIVE.

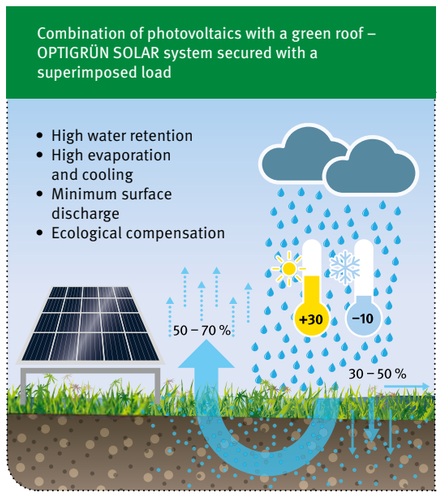
Climate change and energy transition are major issues for the future. The intelligent use of roof areas is a key part of the solution.

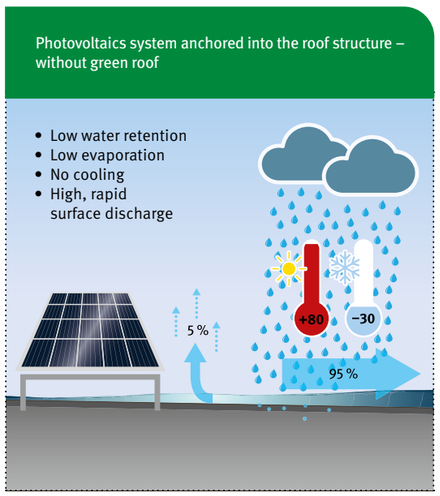
Green roofs increase the economic and ecological functionality of the building. Especially in terms of stormwater management, buildings with green roofs have become an important part of the construction world as they minimise the environmental impact of the building on the environment. Many cities and municipalities recognise green roofs as a necessity and are changing their development plans to this effect.

PV systems for electricity generation are of economic interest to many building owners and investors – whether it be for personal use of the generated electricity or for feeding into the public electricity grid. Multifunctionality is the new goal of urban planning. The combination of green roof and PV system forms a particularly efficient system in this respect.

THE SOLAR GREEN ROOF COMBINES MANY ADVANTAGES:

- Efficiency increase for the photovoltaics system
- Green roof to preserve the natural water balance
- Increase in biodiversity
- Reduction in rainwater discharge and contribution to attenuation targets





OPTIGRÜN SOLAR is a solar mounting system that is secured with a superimposed load and is fixed in position and protected from wind suction by the green roof structure. No roof penetration is necessary for the installation of the system, so it does not require any work involving the waterproofing.

The versatile substructure of OPTIGRÜN SOLAR makes it possible to mount almost all standard solar modules, with inclines of 10°, 15° or 20°. The rows of modules can be installed in a south-facing or east-west orientation. The modules can be attached to it both vertically (portrait) and horizontally (landscape).

With OPTIGRÜN SOLAR, two system structures become a solar green roof:

ECONOMY ROOF: The sophisticated and highly functional system structure for extensive green roofs, which has proven itself in practice for decades.

RETENTION ROOF FLOW CONTROL: An economical and efficient product for rainwater retention and water discharge delay, which creates a temporary and permanent water reservoir on the roof.

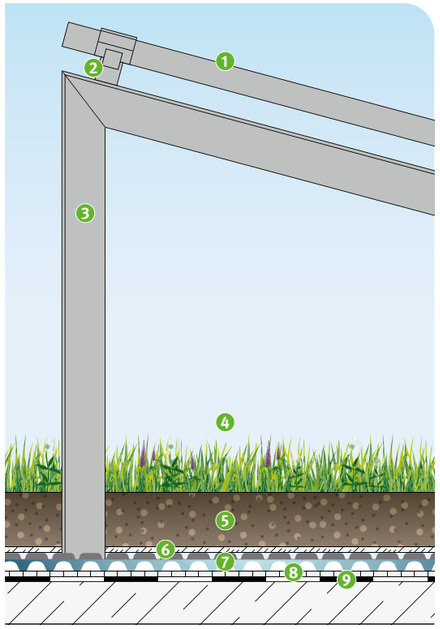
THE RIGHT SOLUTION FOR EVERY REQUIREMENT.

OPTIGRÜN SOLAR **FKD**

GOOD TO KNOW:
The solar green roofs are an intervention mitigation measure under the impact compensation regulation and meet the requirements of the FLL green roof guidelines.

Functional and safe, with proven technology – the OPTIGRÜN ECONOMY ROOF becomes a solar green roof with the addition of the mounting system.

The Drainage and Storage Board FKD 25 offers a spacious water reservoir and reliably drains excess water. Combined with the Filter Fleece FIL 150, optimum water distribution is guaranteed. The vegetation is thus well supplied even under the rows of PV modules.



1. Photovoltaic module
2. Easy Mounting Rails with Module Clamps
3. Solar Mounting Frame 15°
4. Sedum Cuttings in several species
5. Extensive Substrate
6. Filter Fleece FIL 150
7. Drainage and Storage Board FKD 25
8. Protection and Storage Fleece RMS 500
9. Waterproofing

DRAINAGE AND STORAGE BOARD FKD 25

The solar green roof with sophisticated system structure

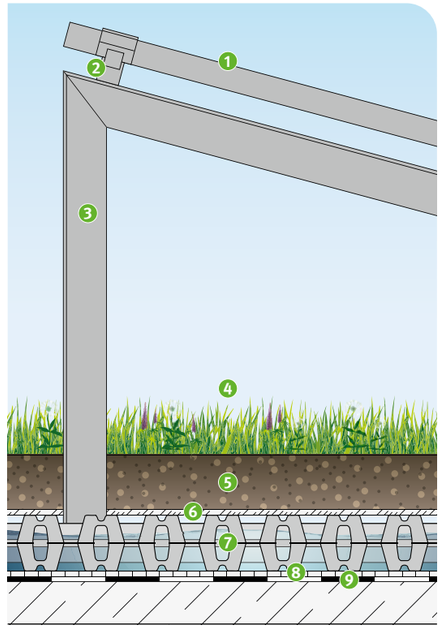
Dimension of a mounting support:
2,000 x 1,000 x 714 mm

Material:
Aluminium (Base Plate and Mounting Frame)
Recycled HDPE reclaim (FKD 25)

Water reservoir in the system structure:
approx. 25 l/m²

Weight of the system structure including mounting support and PV modules: from 110 kg/m²

OPTIGRÜN SOLAR **WRB**



The OPTIGRÜN RETENTION ROOF FLOW CONTROL reliably ensures excellent rainwater management – even in combination with solar mounting supports.

The use of the proven Water Retention Box WRB 80F creates a high retention volume on the roof and minimises discharge. Integrated capillary columns ensure that the stored precipitation water is transported into the substrate level, thereby causing a high degree of soil and plant evaporation. This is an important contribution to the preservation of natural water balance.

At the same time, the flow control solution provides the means to comply with flood volume requirements and restrictions on discharge.

The OPTIGRÜN SOLAR WRB system structure enables remarkably multifunctional roof use.

The solar green roof solution to preserve the natural water balance

Dimension of a mounting support:
1,964 x 1,100 x 714 mm

Material:
Aluminium (Base Plate and Mounting Frame)
Recycled HDPE reclaim (WRB 80F)

Water reservoir in the system structure:
approx. 95 – 150 l/m²

Weight of the system structure including mounting support and PV modules: from 120 kg/m²

WATER RETENTION BOX WRB 80F

1. Photovoltaic module
2. Easy Mounting Rails with Module Clamps
3. Solar Mounting Frame 15°
4. Sedum Cuttings in several species
5. Extensive Substrate
6. Suction and Capillary Fleece RMS 500K
7. Water Retention Box WRB 80F with Capillary Columns
8. Protection and Storage Fleece RMS 500
9. Waterproofing

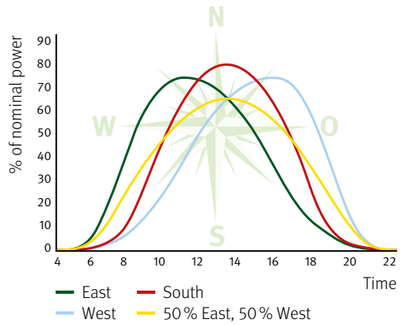
INCREASED COOLING. INCREASED BIODIVERSITY.

The combination of green roof and photovoltaics has a positive effect on the biodiversity of flora and fauna. The photovoltaic system ensures that several vegetation areas can be formed on one roof. Different amounts of sunlight and water in front of, underneath and between the modules provide a habitat for different plant and animal species.

The positive effect on biodiversity, the increase in the efficiency of the PV system due to the cooling capacity and the structural advantages of the system secured with a superimposed load go far beyond the advantages of the individual systems. Solar green roofs such as OPTIGRÜN SOLAR FKD/WRB are therefore of great importance for the further sustainable development of cities.

SOLAR MOUNTING SUPPORTS – A MATTER OF ORIENTATION.

ORIENTATION OF A PHOTOVOLTAIC SYSTEM EAST-WEST OR SOUTH?

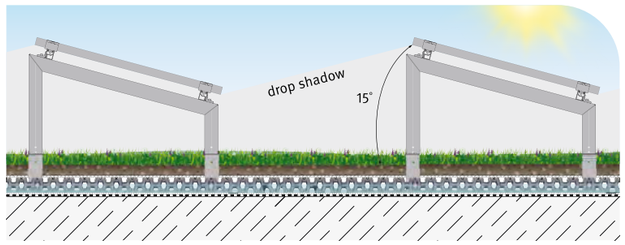


Comparison of photovoltaic systems with different orientations on a Sunday (8th July 2013). Source: Meteocontrol data from Sonneninitiative's plant.

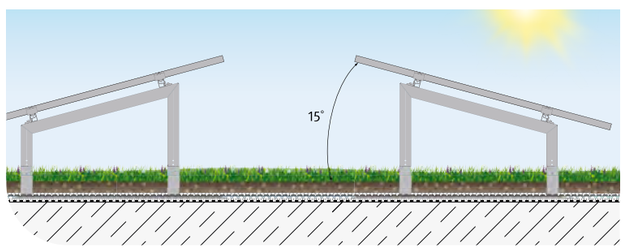
Nowadays, solar panel schemes can be installed both in a south-facing orientation and in an east-west orientation. Depending on the objectives of the building owner and the surrounding area, an east-west orientation can even be the most effective solution.

If the energy generated is to be used for personal use, a constant power supply is important. This is more likely to be achieved by an east-west installation, while, in the case of a south-facing installation, the intensive midday sun provides higher yields over the short term and is thus suitable for feeding into the grid. Whichever orientation you choose, as an expert in solar green roofs, we help you to plan your building project, including advice regarding module orientation.

During planning, OPTIGRÜN makes sure that no shading occurs due to fascias, adjacent parts of the building or excessively narrow module row spacing. Module row spacing that is too tight also hampers the regular maintenance of the solar green roof (care and maintenance). To prevent the modules from being shaded by vegetation, OPTIGRÜN recommends the use of sedum shoots. The species are low-growing and spreading. This ensures a sufficiently large distance between the bottom edge of the module and vegetation.



South-facing orientation with 15° incline



East-west orientation with 15° incline

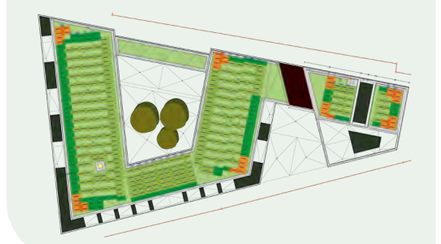
PERFECT PLANNING PROCESS THROUGH FAR-SIGHTED ADVICE.

The combination of photovoltaics and green roofs requires a high level of expertise right from the planning phase. Optigrün's experts support architects and planners throughout the entire construction phase.

THE PROCESS IS AS FOLLOWS:

1. INITIAL CONSULTATION ON SITE OR ON THE PHONE.

2. DETERMINATION OF THE INDIVIDUAL CONDITIONS AND PREREQUISITES FOR THE BUILDING PROJECT WITH THE HELP OF OUR CHECKLIST.



3. CREATION OF INSTALLATION PLANS AND VERIFIABLE PROOF OF STABILITY IN THE EVENT OF AN ORDER.

UNRIVALLED SERVICE – STRUCTURAL ANALYSIS:
Based on a wind certificate, verifiable proof of stability for the entire system is created in accordance with Eurocode 1 and 9.

ECONOMICAL USE OF RESOURCES – SAME PERFORMANCE.

OUR EXCLUSIVE CALCULATION SERVICE

After receiving an order, we create an **optimised installation plan** for your building project. The calculations by our application technology engineers ensure that your solar green roof can be implemented cost-effectively with minimal use of materials and time.

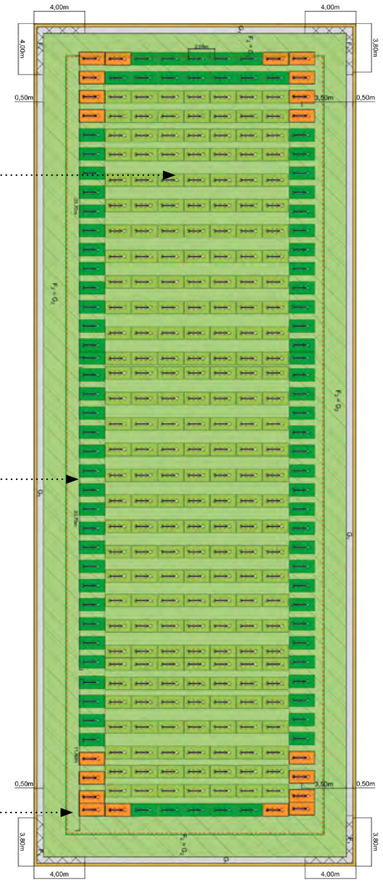
This service is naturally **free of charge for you!**

SERVICE REQUESTS:
https://www.optigruen.com/downloads/checklists

Taking into account the building characteristics and the specifications of the master plan, the ideal number of PV modules for the project is determined. The roof area is used in the best possible way to generate renewable energy.

The project specific planning of the distances between the mounting supports is carried out taking into account wind load zones. As a result, the distances between solar mounting supports can be increased at the centre of the building, which means that fewer solar mounting supports are required overall. The solar green roof can thus be implemented with minimal material use and without any restrictions on stability.

The minimum load is determined for different roof zones and the required substrate height is adjusted for each area. In the installation plan, each wind load zone is shown in a different colour. In the corner and edge areas, the wind loads and thus the necessary substrate load are particularly high. In the internal roof areas, on the other hand, a load of 50 kg/m² may already be sufficient. Overall, a lighter green roof structure is possible thanks to the wind load zone-specific planning.



THE INNOVATIVE SOLUTION WITH PRACTICAL IMPROVEMENTS.

PERFECT SYSTEM, EASY ASSEMBLY

- Low weight of the OPTIGRÜN SOLAR system structure
  - Also suitable for roofs with limited load capacity
  - Easy to use, especially on the construction site
- Compact stacked components, reduced packaging
- Significant time savings due to quick and easy installation of the solar mounting support
- Integration of the solar mounting support into the drainage and storage board or the water retention box – no slipping of the superstructures
- Saving of costs for material, transport and assembly

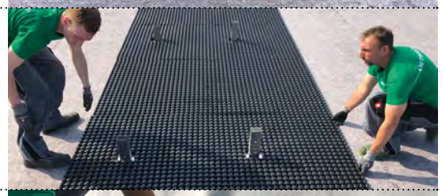
Thanks to **optimised planning** by the experts at OPTIGRÜN and the innovative rail system, the distance between solar mounting supports in the inner part of the roof area is generally increased. As a result, fewer solar mounting supports are required. Installation with the correct spacing is simplified by spacer boards.

The savings in weight, money and time are significant!

EASY INSTALLATION IN JUST A FEW SIMPLE STEPS.

1. Place the Drainage and Storage Board FKD 25 or Water Retention Box WRB 80F above the Base Plate.

2. Arrange rows according to the installation plan, insert spacer boards if provided.



3. Lay Filter Fleece smoothly over the rows and cut over the supports.

4. Insert the Mounting Frame into the supports of the Base Plate and screw in place.

5. Fit the Easy Mounting Rails.

6. Attach Wind Bracing one per row.

7. Ballasting of the solar mounting support with substrate.

OPTIGRÜN®

PLANS BECOME REALITY
WHEN THERE ARE EXPERTS AT WORK.

As specialists in a wide range of green roof systems, we offer a comprehensive product range with solutions that cater to all requirements. We are happy to support you in your current project with innovative technologies and comprehensive technical support services.

ECONOMY ROOF

LIGHTWEIGHT ROOF

NATURE ROOF

RETENTION ROOF
MEANDER

URBAN GARDENING

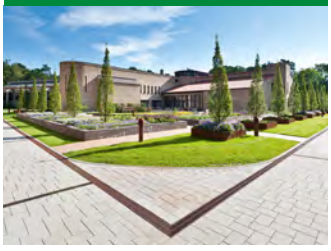
PITCHED ROOF

GARDEN ROOF

LANDSCAPE ROOF

RETENTION ROOF
FLOW CONTROL

PUBLIC ROOF



SYSTEM ADDITIONS

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Subject to technical modifications.
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