



BIO-SOLAR ROOFS

HOW GREEN ROOFS CAN SAVE ENERGY AND
INCREASE SOLAR PANELS' PERFORMANCE

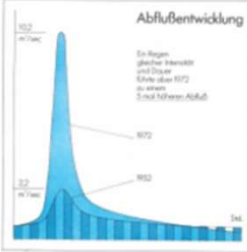
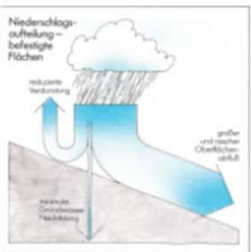
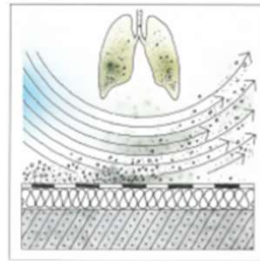
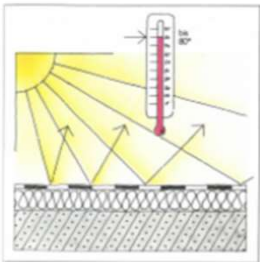
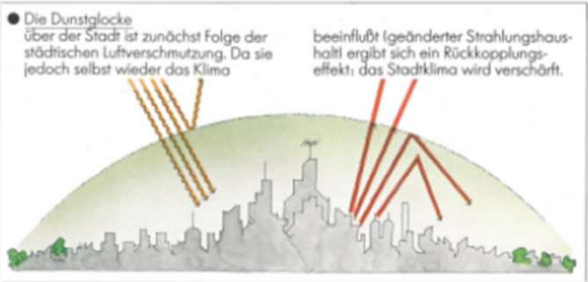
AGENDA

I. BENEFITS OF THE COMBINATION

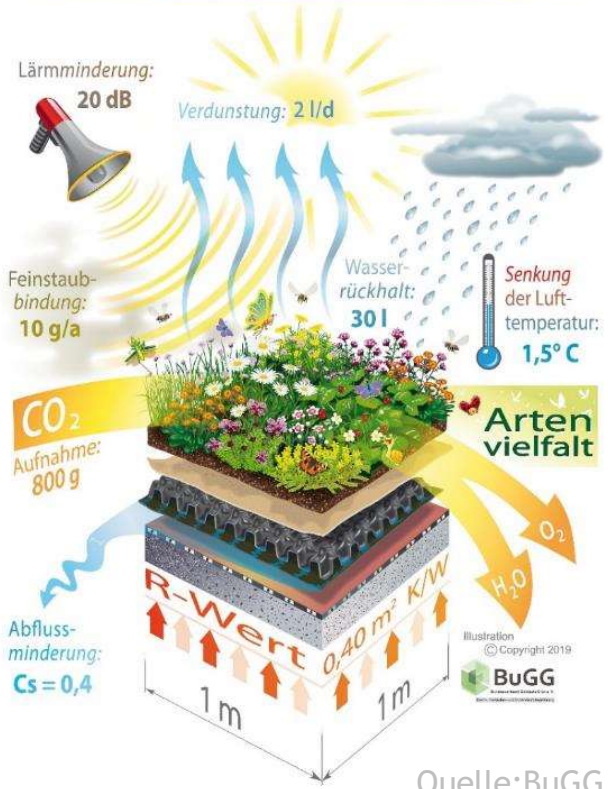
II. THE OPTIGRÜN-SOLAR ROOF

III. PLANNING PRINCIPLES

I. BENEFITS OF THE COMBINATION



EXTENSIVE DACHBEGRÜNNUNG LEISTUNG EINES QUADRATMETERS



Quelle: BuGG

I. BENEFITS OF THE COMBINATION

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EFFICIENCY INCREASE



Cooled modules have a higher efficiency and thus generate more energy

POINT LOADS ARE AVOIDED

The uniform load distribution of the substrate eliminates point loads (e.g. from concrete slabs)

PROTECTION OF THE ROOF WATERPROOFING



Reduced vulnerability of the roof waterproofing
Lifetime of the waterproofing is extended

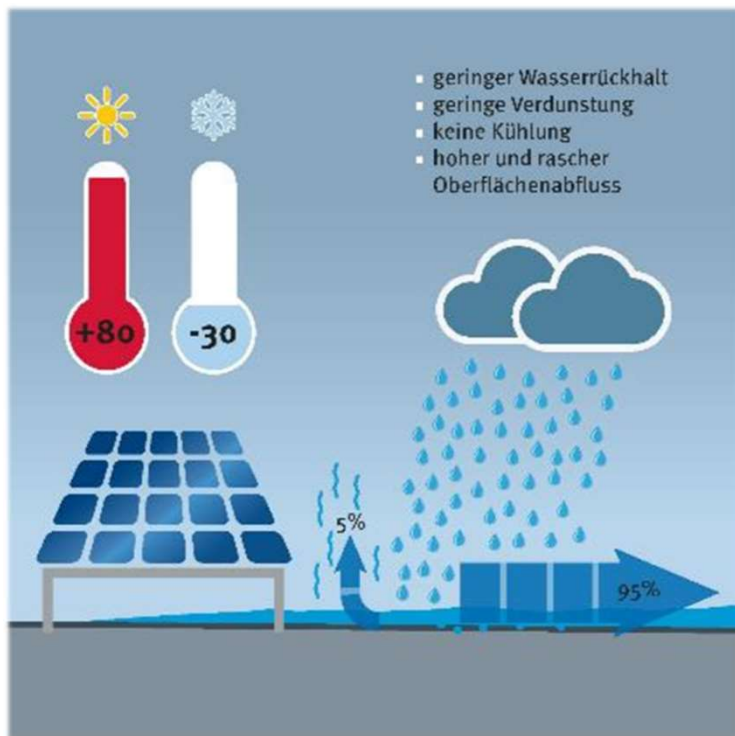
PROMOTING BIODIVERSITY



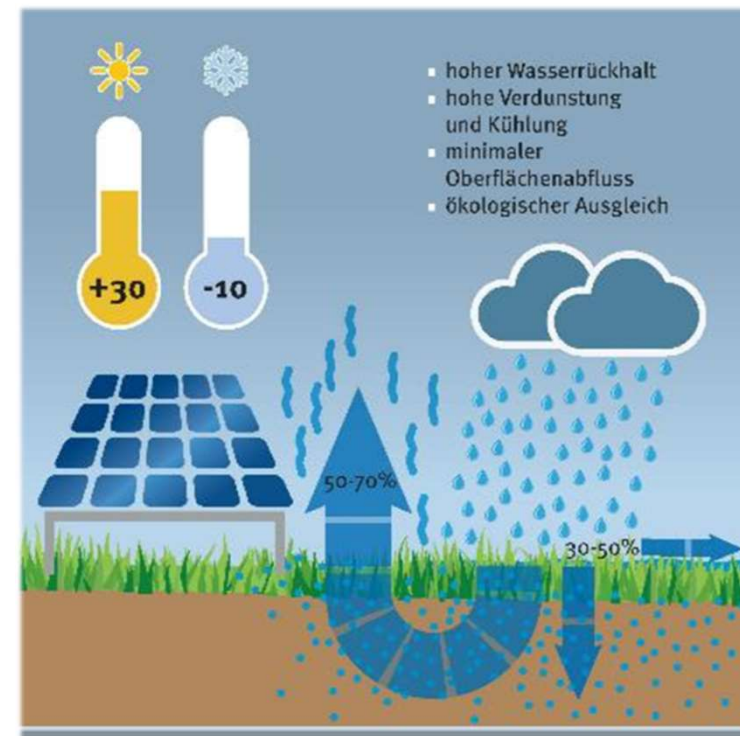
The right plant selection contributes to the protection of species

I. BENEFITS OF THE COMBINATION

YIELD INCREASE

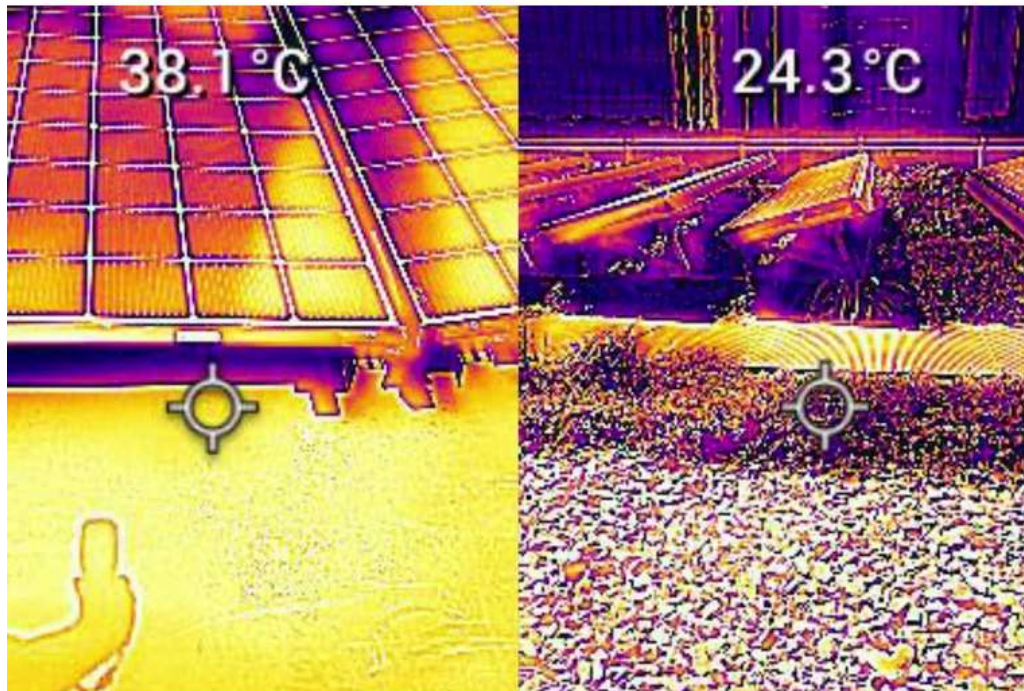


Vs.



I. BENEFITS OF THE COMBINATION

YIELD INCREASE



In hot days, surface temperatures were up to 20 degrees lower on the green roof compared with the standard solar roof. (Supplied: University of Technology, Sydney.)

- more than 20° C difference on hot days
- Up to 20 % increase in output at peak times
- Up to 3.6 % increase in solar panel output over the length of the experiment
- Over 8 months additional 9.5 MWh or \$ 2,595 worth of renewable energy generated

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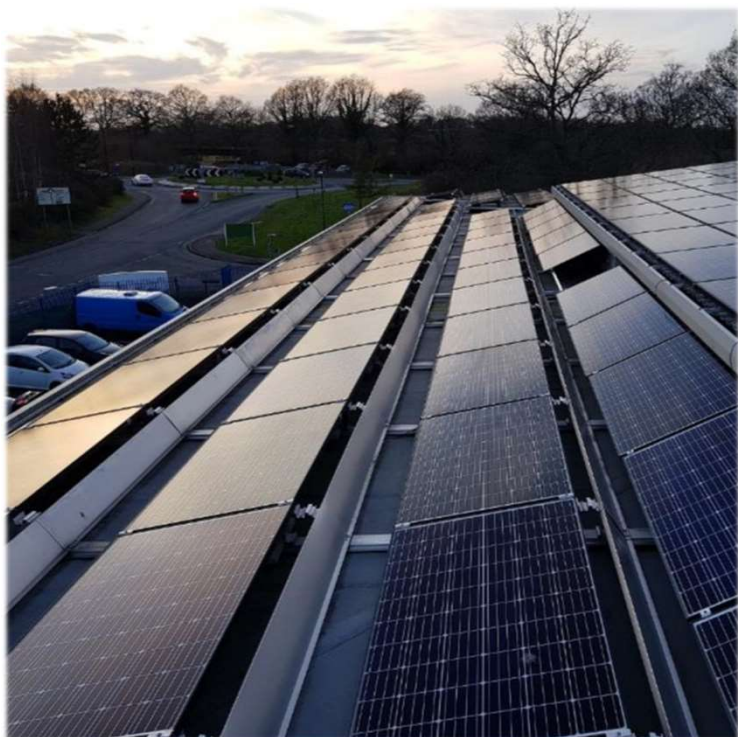
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The right plant selection contributes to the protection of species

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PROTECTION OF THE ROOF WATERPROOFING



Source: pixabay.com

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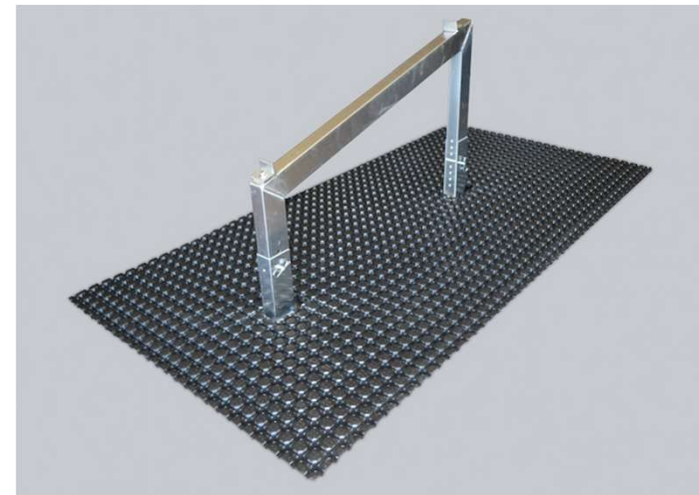
Quelle: pixabay.com

II. The Optigrün-Solar roof

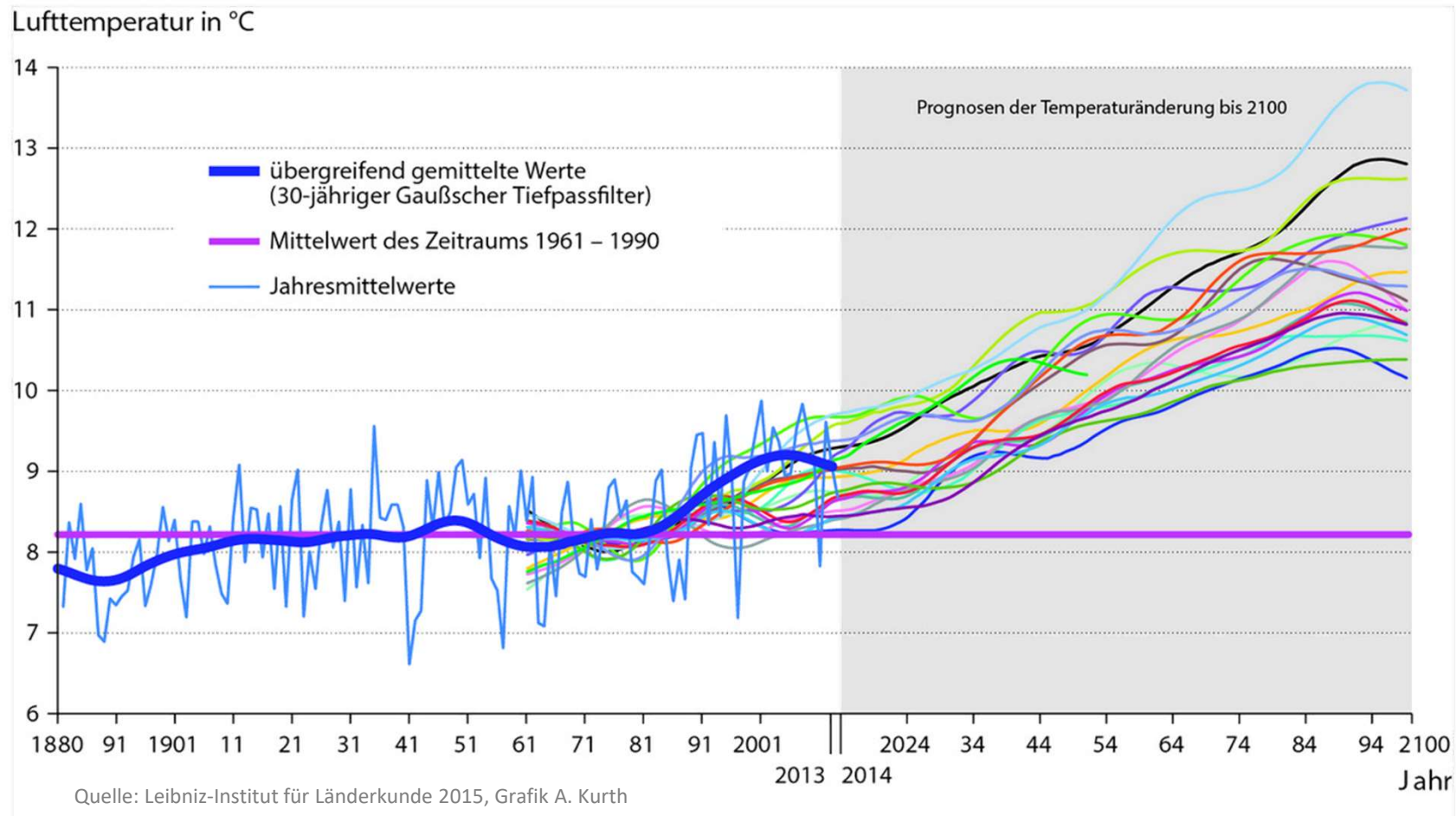
Optigrün „Economy roof“
Typical extensive roof build-up
(0-5°)



Optigrün 's contribution
to the E-Boost...



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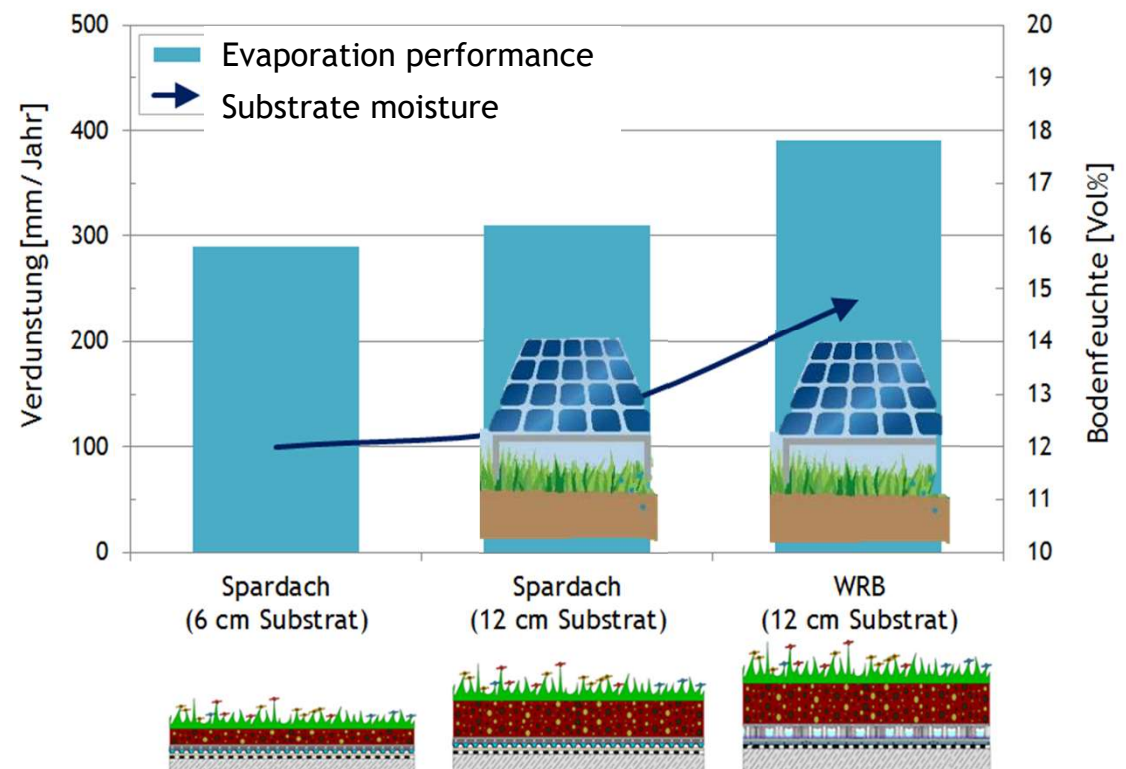
II. The Optigrün-Solar roof

What can we achieve through higher evaporation?

- ✓ Positive effect on the microclimate
- ✓ Cooling effect
- ✓ Reduction of „urban heat islands“
- ✓ Water vapor formation
- ✓ Fine dust binding

- ✓ solar-panel become more efficient

Evaporation performance of green roofs

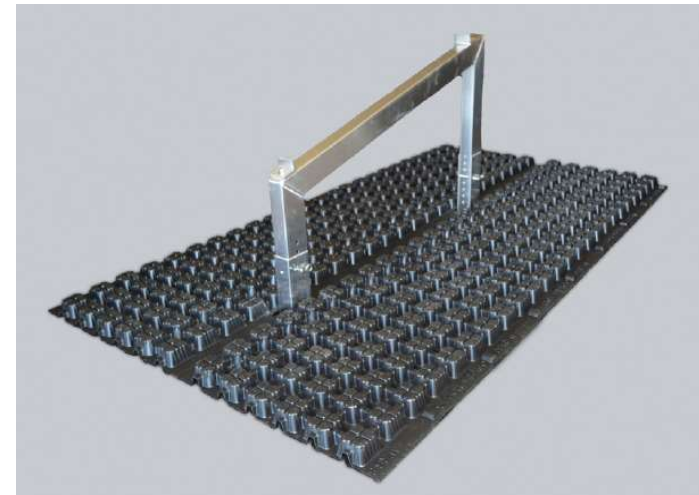


II. The Optigrün-Solar roof

Optigrün „Retention roof flow control“
Solution for low water discharge and retention (0% roof pitch)



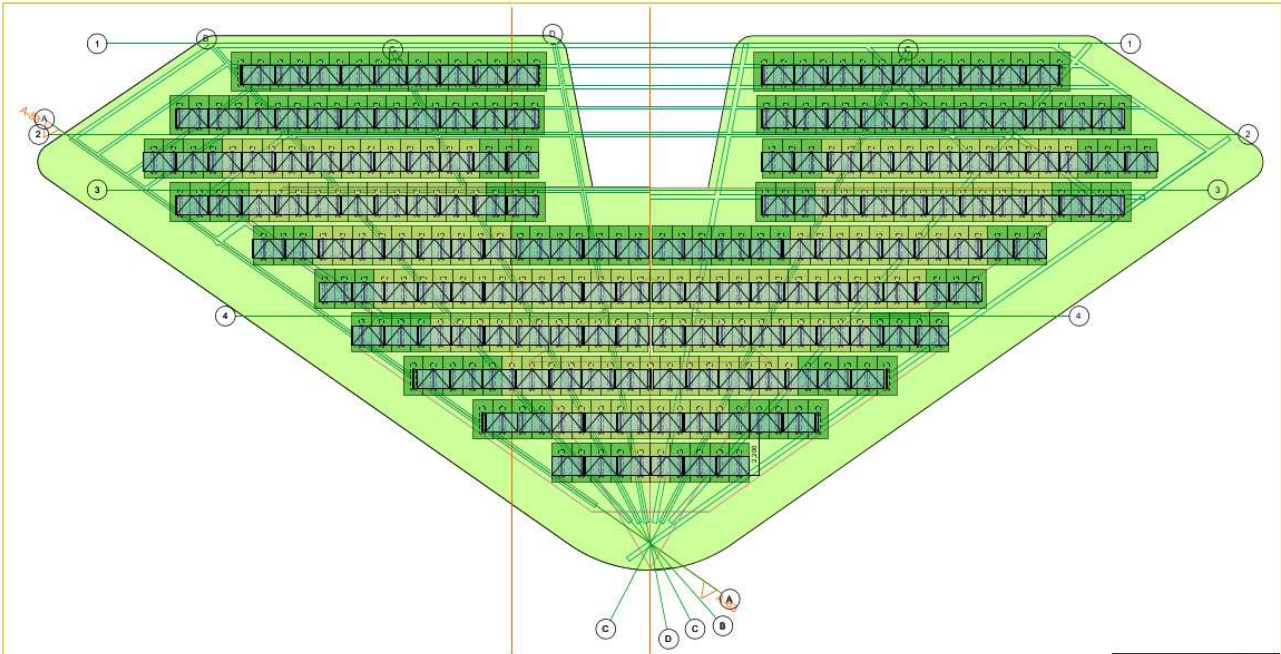
Optigrün´s contribution
to the E-Boost...



III. PLANNING PRINCIPLES

BASES

- Panel inclines
- Exposure
- Distance between the rows
- Installation method
- Load reserve
- Roof pitch
- Substrate
- Vegetation



Ballastierung Sun-Root (Mindestaufbau/ eigene Lagesicherheit bei befestigter Abdichtung)

required load: 0,65 kN/m²	required load: 0,35 kN/m²
Build-up: - PV module - Optigrün-Solar Frame - Vegetation - 8 cm Substrate E - Filter fleece FIL 150 - Drainage Board PFD 25 - Optigrün-Solar Base Plate	Build-up: - PV module - Optigrün-Solar Frame - Vegetation - 8 cm Substrate E - Filter fleece FIL 150 - Drainage Board PFD 25 - Optigrün-Solar Base Plate
Table Protection: Phase not V. 100 0,74 kN/m² dry weight 0,88 kN/m² water saturated = 197 pcs.	Table Protection: Phase not V. 100 0,74 kN/m² dry weight 0,88 kN/m² water saturated = 149 pcs.

Specification PV system

Number of Base plates	305
Number of PV-panels	178
Number of rows	18
Panel size in mm	length 1650 width 995 height 40
Gesamtleistung in kWp (bei Mittelwind ca. 100 W/m²k)	ca. 53,4

Approved by: client/planner/contractor
Stamp:
Date:
Signed:

Building specifications

Building height	0,00 m
Wind zone	1
Terrain category	III
Snowweight zone	2

PLEASE NOTE:
This document is provided as a technical service. It has been drawn up on the basis of information provided to us, and to the best of our knowledge and ability. The calculations do not present a design service and do not exonerate the designer/architect/safety coordinator from his due diligence.
The calculation was carried out on the basis of the specific characteristics of the complete Optigrün System Solutions. This calculation and technical preparation is therefore not transferable to other products and systems. The approval by the client/planner/contractor is a mandatory requirement!

Delivery and installation only after the build-up has been approved by Optigrün International AG!

Scale:	Date:	Rev./Detail:
	18.09.2020	0

OPTIGRÜN®
DIE DACHBEGRÜNER

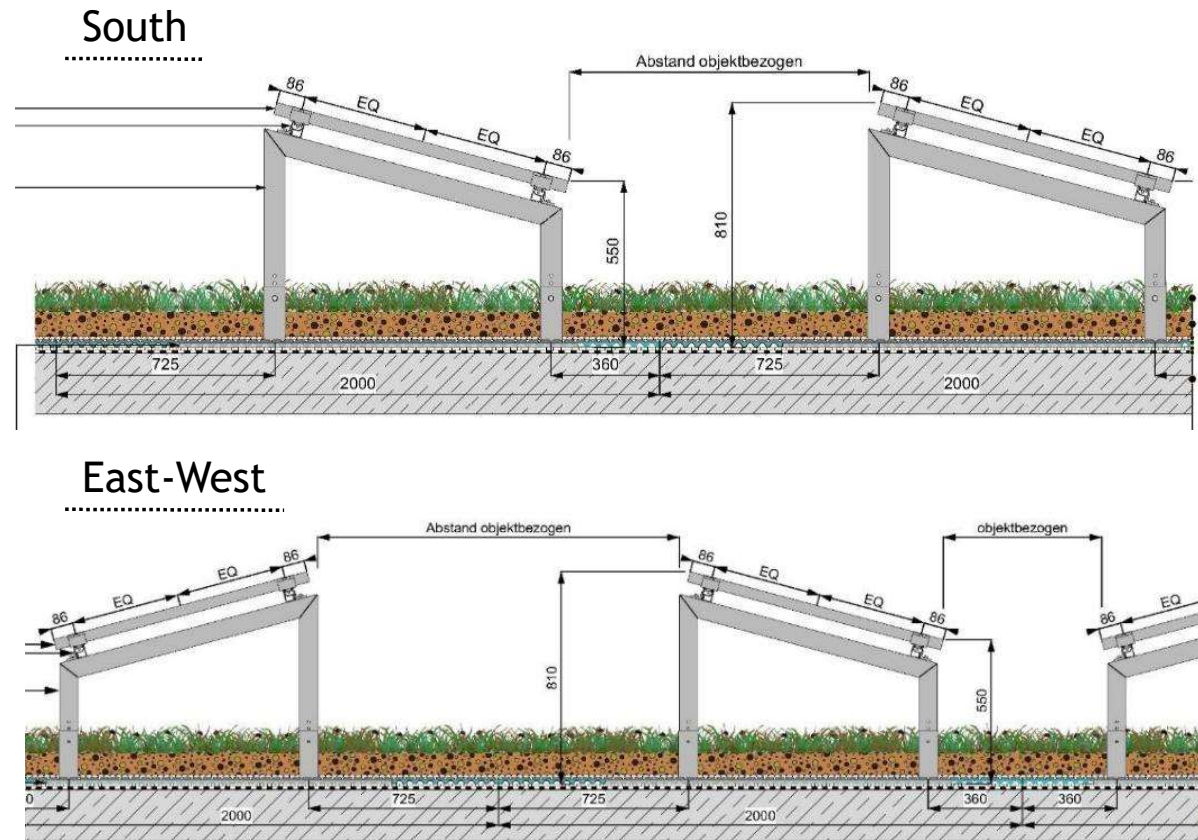
SUN-ROOT 15

Name	Dorn nad jezozorem, Jelonek
Location	Gniezno
Project Nr.	20147772
signed	VG 04.09.2020
changed	VG 18.09.2020
Approved by	J.A.
Approved by planner	
Optigrün International AG Am Bismarck 15-19 D-72505 Kraichenwies-Gögingen Tel.: +49 7576 772-0	

III. PLANNING PRINCIPLES

BASES

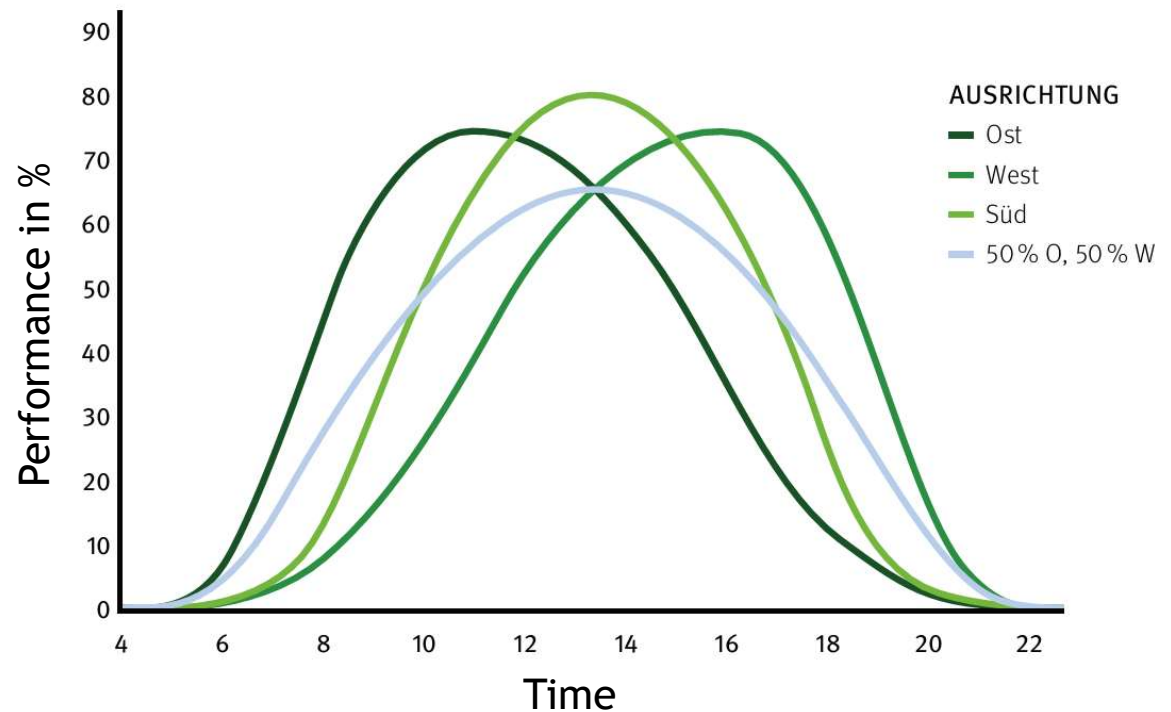
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Exposure of modules: East-West or South?

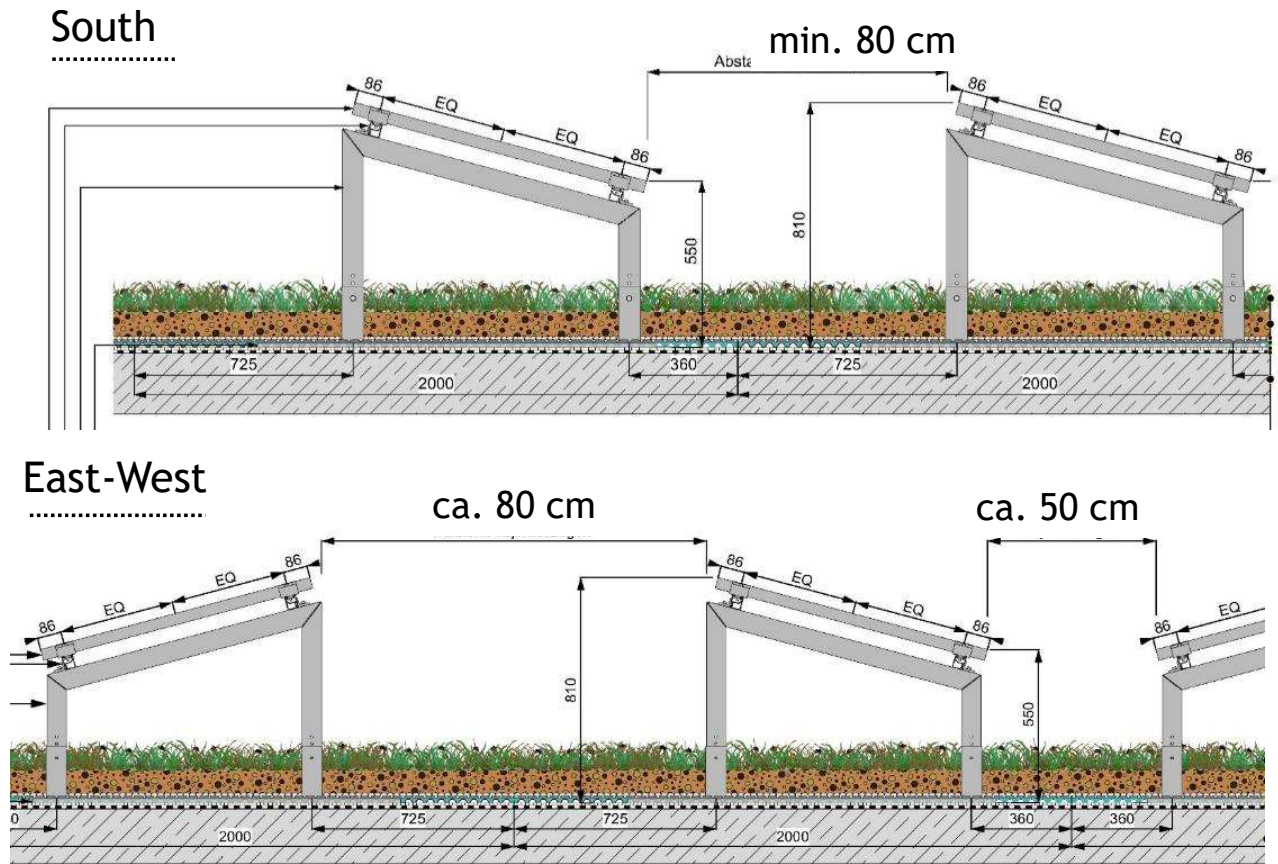


Vergleich von Photovoltaikanlagen unterschiedlicher Ausrichtung an einem Sonntag (8. Juli 2013).
Quelle: Meteocontrol-Daten aus dem Anlagenpark der Sonneninitiative.

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Portrait /
Vertically



Landscape /
Horizontally



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LOAD RESERVE

Protection fleece		Solar mounting frame
Drainage	+	Solar panel
Filter fleece		
Substrate layer (min. 6 cm)		
.....	
ab 90 kg/m ²	+	ca. 15,5 kg/m ²

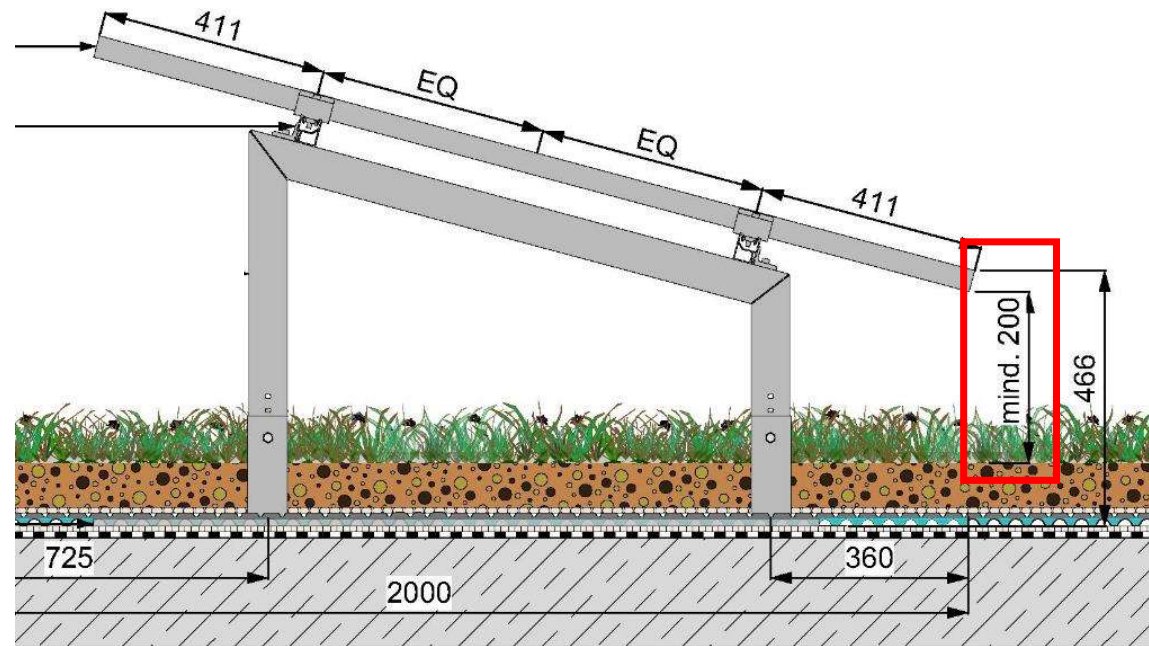
ROOF PITCH

0 - max. 5 °

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- Vegetation

– Equal construction height of 8-10 cm or with different heights varying between 6-15 cm.



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- sedum-moss-herb greening with a max. growth height of 15-20 cm

SAATGUTLISTE | SEED MIX LIST | ZAADGOEDLIJST

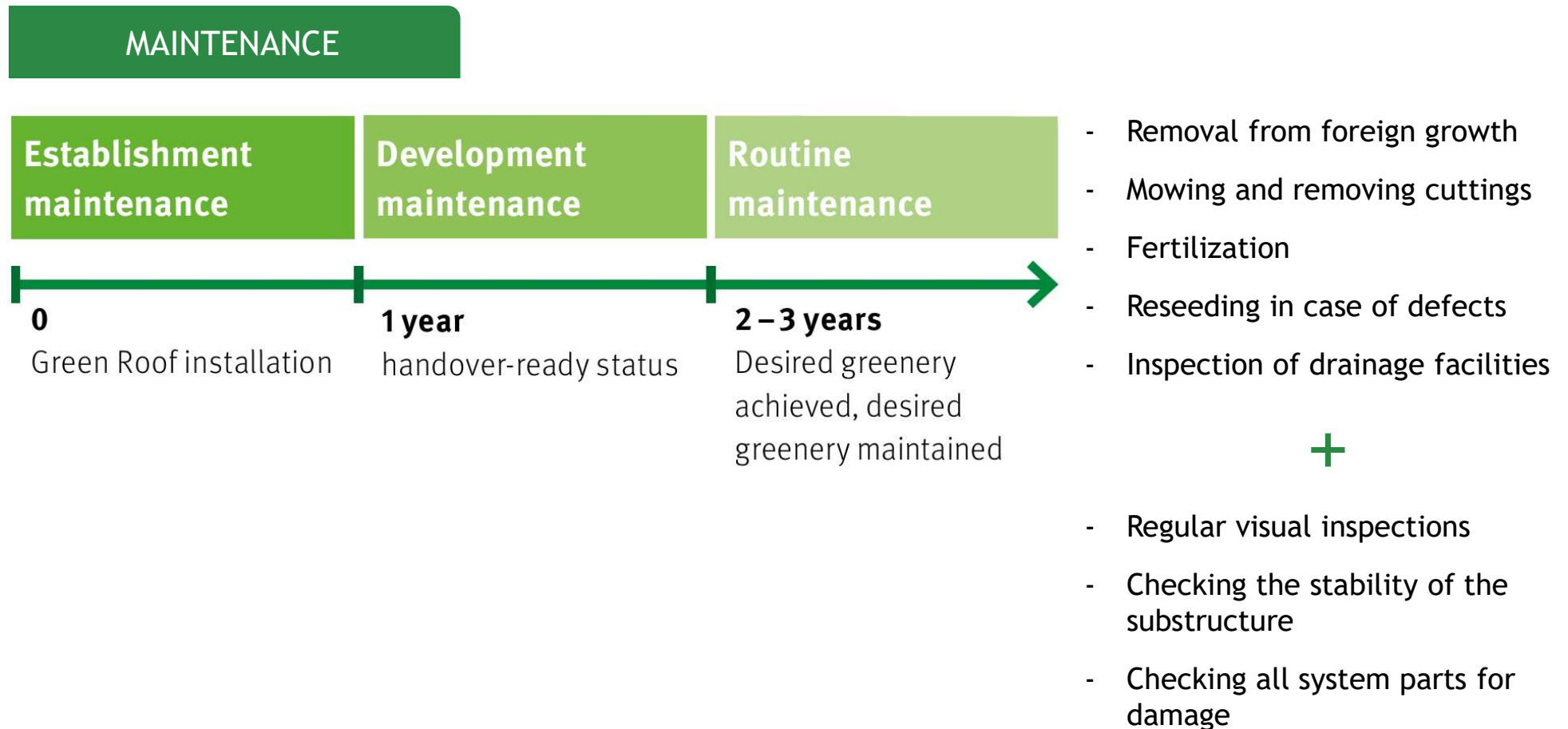
SOLARGRÜNDACH

Substratstärke | substrate depth | Substraatdikte > 60 mm

Polsterstauden | Ground Covering Perennials | Vloerbedekking Vaste Planten

Papaver croceum	Altaiischer Mohn Ice Poppy Ijslandse papaver		250 mm		VI -VIII	
Phacelia sericea	Seidenhaarige Phacelie Silky Phacelia Zilverbladig bijenvoer		250 mm		VI -VIII	
Prunella grandiflora	Großblütige Prunelle Large Self-Heal Grootbloemige brunel		200 mm		VI -VIII	
Prunella vulgaris	Gewöhnliche Prunelle Common Self-Heal Gewone brunel		250 mm		VI -IX	
Thymus pulegioides	Breitblättriger Thymian Broad-leaved Thyme Grote tijm		300 mm		VI -X	
Thymus serpyllum	Sand-Thymian Breckland Thyme Kleine tijm		150 mm		VI -X	
Thymus serpyllum 'Albus'	Sand-Thymian 'Albus' Breckland Thyme 'Albus' Kleine tijm 'Albus'		100 mm		V -VII	
Thymus vulgaris	Thymian Garden Tyme Echte tijm		250 mm		VI -X	

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Thank you for you
attention!

Any questions?
solar@optigruen.de

