

Solar potential analysis

# Realise potentials – Achieve goals

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## tetraeder.solar gmbh

- Based in Dortmund, Germany; founded in 2009 as affiliated company of tetraeder.com gmbh (founded in 1995)
- 31 employees in both business fields, mostly experts for spatial planning and (geo-)informatics



## OUR FOCUS

- Highly efficient processing of large amounts of data in the field of renewable energies with spatial reference
- Leading position in analysis and forecasting technology for solar potentials
- Sales support in the area of photovoltaics and electromobility with online tools, data exports and expansion forecasts

# Our products



*for municipalities, counties, regions*

- **Presentation** of potentials regarding solar suitability and roof greening + locations of charging points for e-mobility
- **Product:** Online maps with interactive content selection
- **Benefit:** Freely accessible information, visualisation of solar potential  
→ Increasing awareness of the energy system transformation; promotion of regional value creation



*for energy companies, public utilities*

- **Support** in generating leads both for existing customers and for new customers + support in the subsequent lead management and in efficient preparation of offers
- **Product:** Lead generator (currently solar), Lead management systems, Offer Tool
- **Benefit:** Support of sales, process optimization, increase of conversion rate, enabling a targeted approach



*for distribution network operators, grid providers*

- **Forecasts** on future expansion of solar plants and their feed-in into the distribution grid + forecasts of the distribution development of electric vehicles
- **Product:** Forecasts in the form of maps and analysis reports
- **Benefit:** Precise data for distribution network planning  
→ Early detection of potential bottlenecks in the network

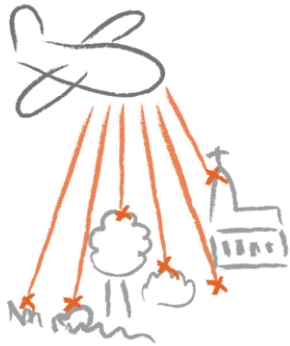




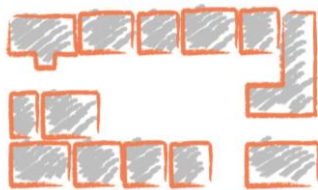
# tetra.MAPS Solar Potential Maps

- Interactive map
- Platform for information and planning
- Register of the suitability of city buildings
- Guidance with knock-on effect

# Technology – How does it work?



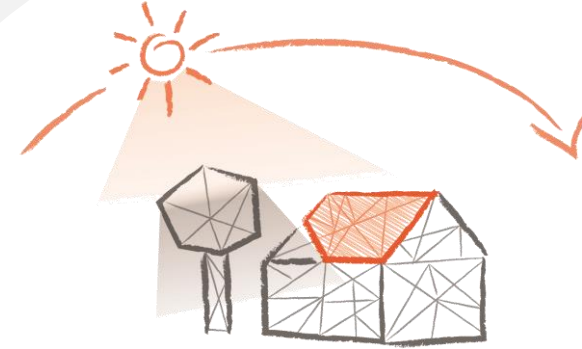
Input data:  
Laser scan / Matching data



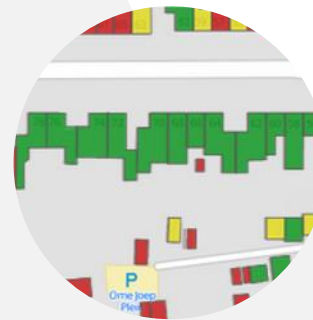
Buildings'  
footprints



tetraeder SolarProcessor



1. Computation of a 3D model
2. Identification of roof surface(s)
3. Simulation of solar radiation development, shading effects and net radiant power



Visualisation of results in a  
solar potential cadastre



# Experience & commendations

Computation of solar potential of more than 55 million buildings in 9 countries

Germany

>1.500 municipalities

[www.solare-stadt.de](http://www.solare-stadt.de)

(>20 m. buildings, steadily increasing due to Open Data and cooperation with Google Sunroof)

The Netherlands

Entire land area

[www.zonatlas.nl](http://www.zonatlas.nl)

(12.4 m. buildings)

Denmark

Entire land area

[www.energyroof.dk](http://www.energyroof.dk)

(3.5 m. buildings)

Austria, Spain,  
Switzerland

Entire land area, based on open data

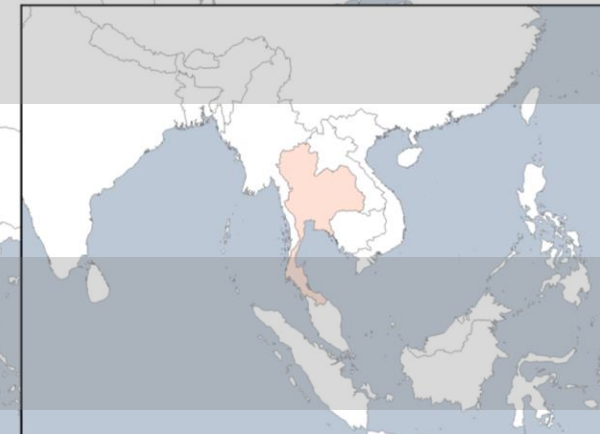
(ca. 18 m. buildings)

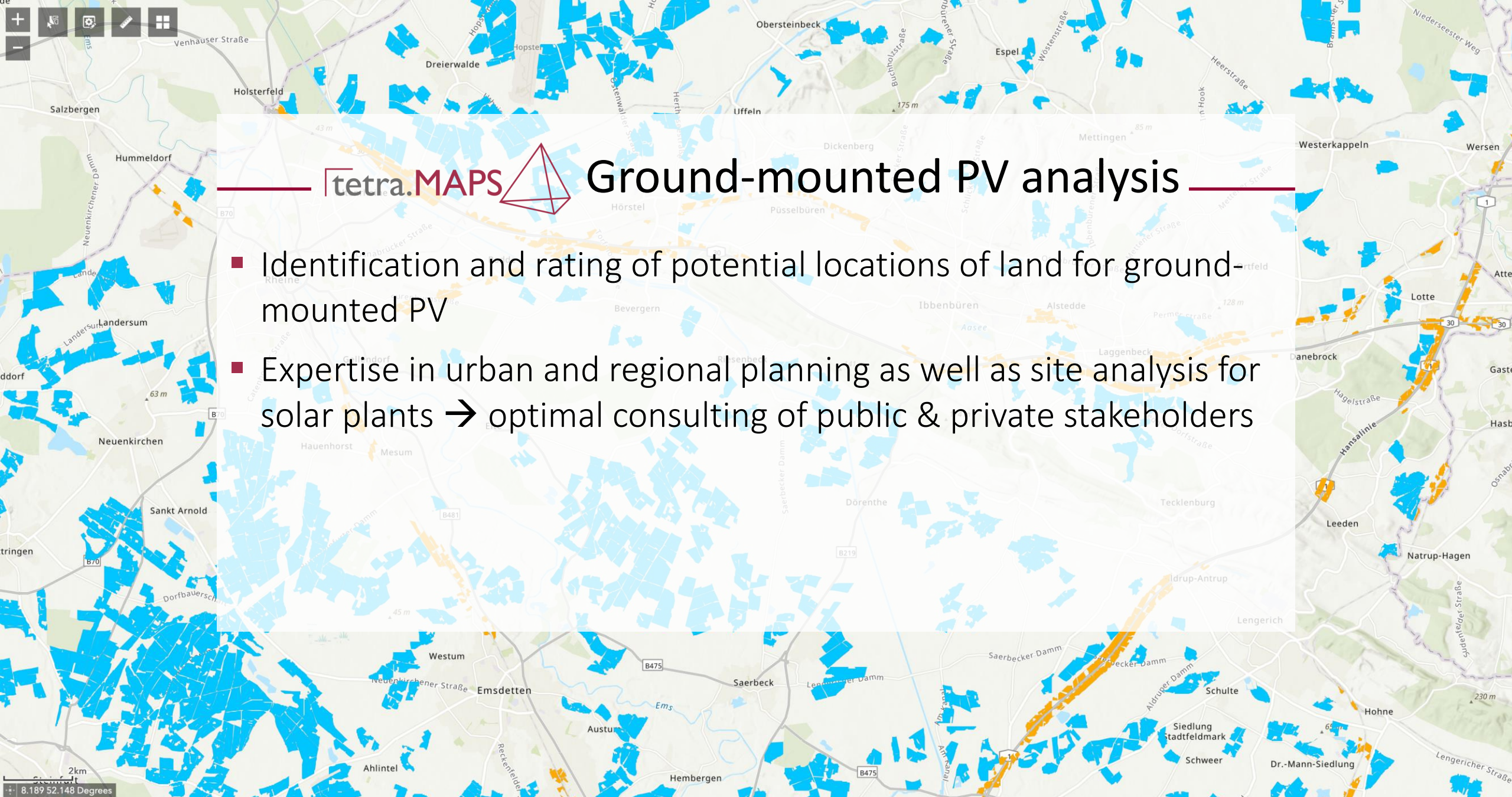
Lithuania, UK,  
Luxembourg

Several individual projects

France, Poland,  
Sweden, Thailand

Pilot projects





## Ground-mounted PV analysis

- Identification and rating of potential locations of land for ground-mounted PV
- Expertise in urban and regional planning as well as site analysis for solar plants → optimal consulting of public & private stakeholders





## E-Mobility-Spotter

- Forecasts on the future distribution of private charging points (“wallboxes”)
- Creation of location recommendations for publicly accessible charging points (“charging columns”)
- Sales support in the context of wallboxes / certified green power contracting





## Leadgenerator Solar


- Online PV computation tool with automated radiation and solar potential analysis
- No complicated questions to your potential customers any more
- Enables targeted customer approach and increase of conversion rate
- Even usable without available potential data



## First results after address input incl. greeting

tetraeder.solar

Start




Google | Bilder © 2021, AeroWest, Maxar Technologies | Nutzungsbedingungen | Fehler bei Google Maps melden

Select another building

The solar potential of your roof

|                   |                                       |
|-------------------|---------------------------------------|
| 82 m <sup>2</sup> | suited roof area                      |
| 11.260 kWh        | yearly yield (max.)                   |
| 5 t               | yearly CO <sub>2</sub> -saving (max.) |

Great! Your roof is very well suited for solar energy!





We from Stadtwerke Musterstadt are pleased to accompany you on the way to your photovoltaic system.  
By answering some questions of our solar system configurator we can offer you a photovoltaic system that is individually tailored to your needs.

[CONFIGURE YOUR PLANT NOW](#)

[Contact us now](#)

back next





## Result overview / call-for-action button



Start

1

2

3

4

5

6


7

8


9

Finished! With your information, we have put together your photovoltaic system.

### Your personal summary



You win  
886 €/year  
from the sun



You are generating  
5.898 kWh/year  
renewable energy




You are gaining  
70 %  
independence

### Your contribution to environmental protection



With your photovoltaic system you save as much CO<sub>2</sub> as 217 trees  
would bind annually.



### Your photovoltaic plant

|                             |                 |
|-----------------------------|-----------------|
| 25 PV modules (6,75 kWp)    | 10.130 €        |
| Storage 7 kWh               | 8.400 €         |
| Installation                | inclusive       |
| <b>Construction cost</b>    | <b>18.530 €</b> |
| Amortisation after 11 years |                 |

Or lease for 165,37 €.  
[Compare now!](#)

Ask for our professionals a free manual module placement with no-binding offer to your individually configured photovoltaic system!

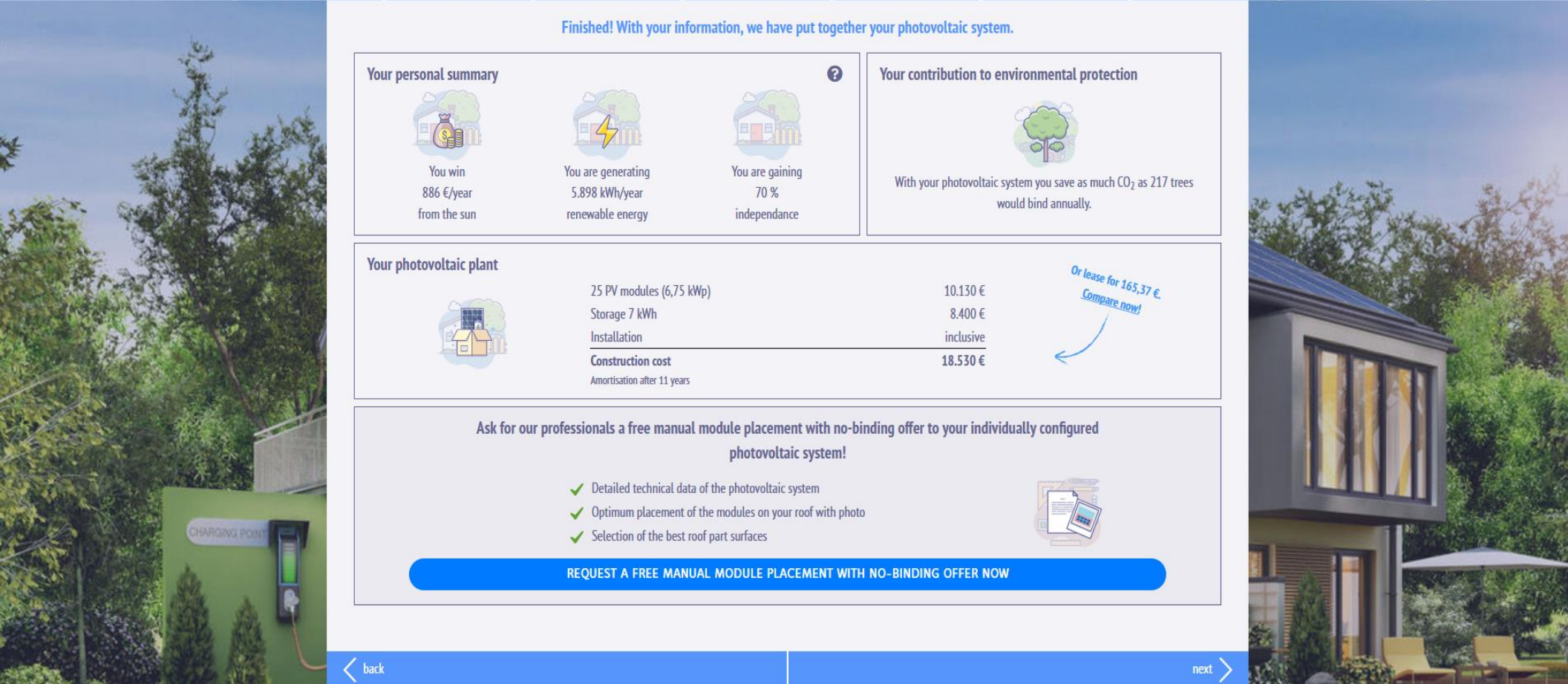
- ✓ Detailed technical data of the photovoltaic system
- ✓ Optimum placement of the modules on your roof with photo
- ✓ Selection of the best roof part surfaces



REQUEST A FREE MANUAL MODULE PLACEMENT WITH NO-BINDING OFFER NOW

< back

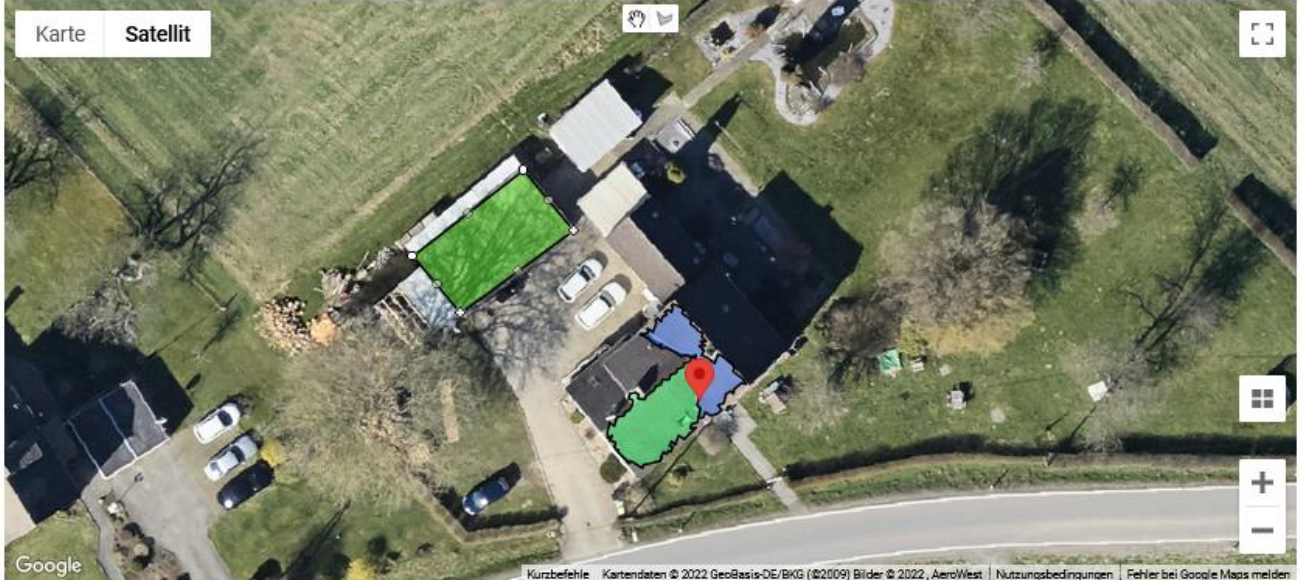
next >





# Building report

- Automatically detected partial roof areas with data availability
  - Size, orientation and tilt are detected automatically
- Possibility to consider neighboring buildings or buildings without data base with polygon tool
  - Alignment and inclination adjustable



Karte Satellit

Google

Kurzbefehle Kartendaten © 2022 GeoBasis-DE/BKG (©2009) Bilder © 2022, AeroWest Nutzungsbedingungen Fehler bei Google Maps melden

Roofs can be deleted by right clicking them on the map.

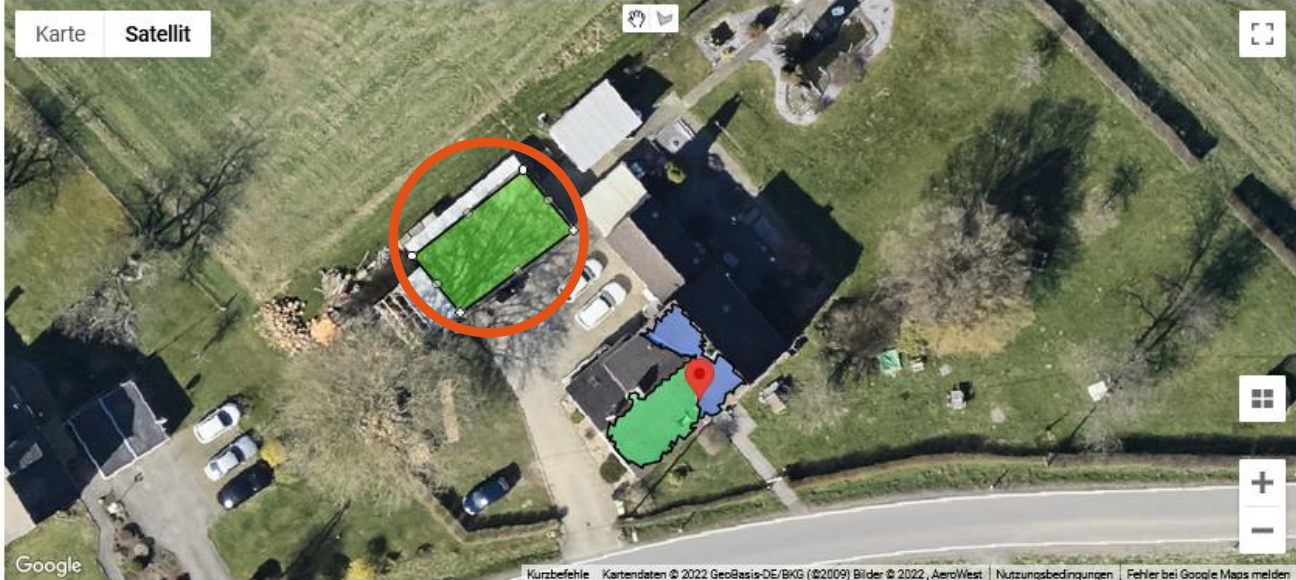
| ID | Area (m²) | Tilt | Orientation |   |
|----|-----------|------|-------------|---|
| 1  | 49        | 42   | 143         | × |
| 2  | 33        | 45   | -132        | × |
| 3  | 68.4      | 0    | 0           | × |

☐ Hide radiation image [Create building](#)



# Building report – Roof areas modelled as polygons (no data)

Roof surfaces without a data basis can be drawn with Polygon tool and included in the calculation



The screenshot shows the Tetraeder.solar web application. At the top, there are tabs for 'Karte' and 'Satellit'. The main area is a satellite map of a residential area. Three roof surfaces are highlighted with hand-drawn polygons: a green rectangle, a blue irregular shape, and a green irregular shape. A red pin is placed on the blue polygon. Below the map, there is a table with the following data:

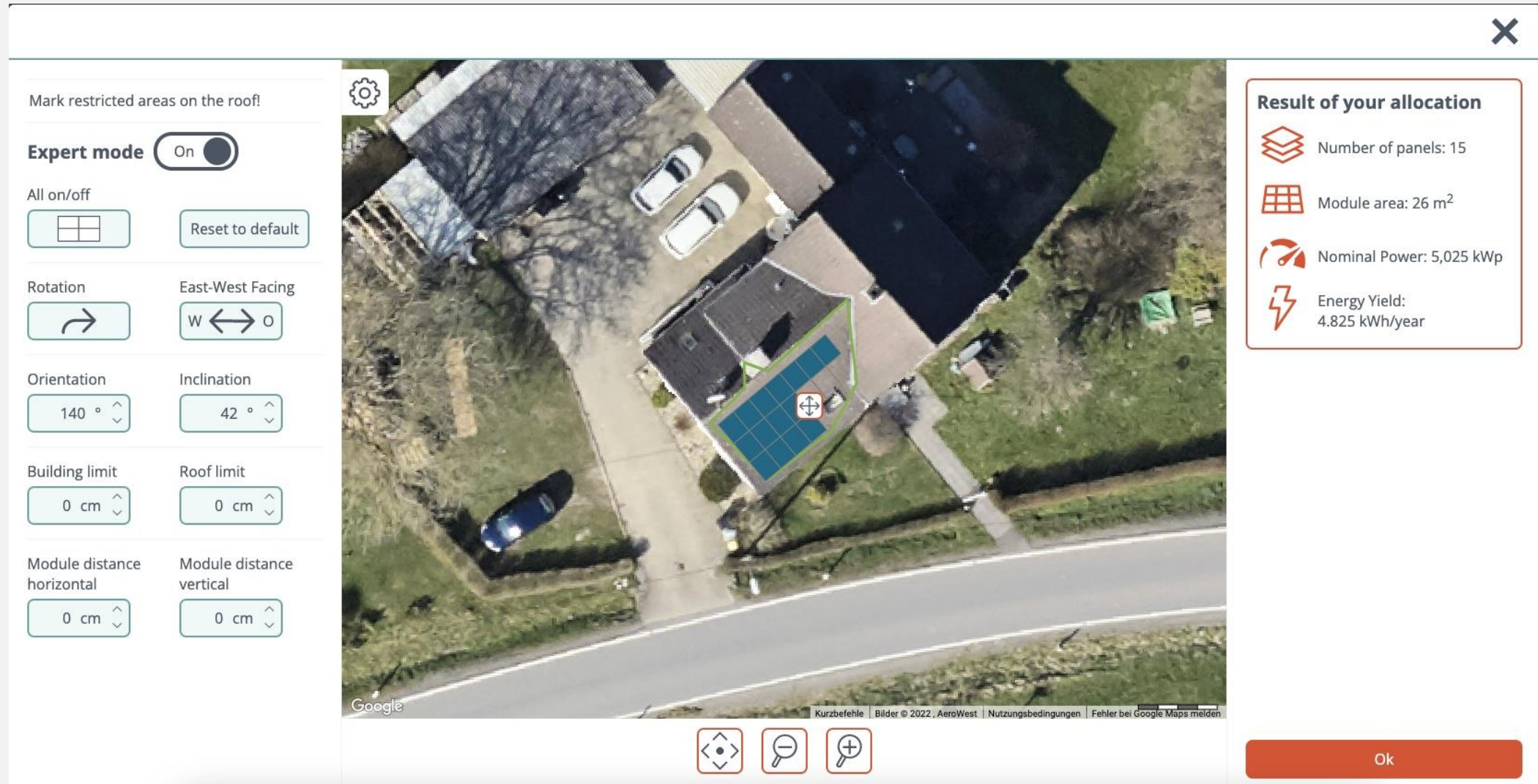
| ID | Area (m²) | Tilt | Orientation |   |
|----|-----------|------|-------------|---|
| 1  | 49        | 42   | 143         | ✕ |
| 2  | 33        | 45   | -132        | ✕ |
| 3  | 68.4      | 0    | 0           | ✕ |

At the bottom right, there is a checkbox for 'Hide radiation image' and a red button labeled 'Create building'.



# Building report – Optional Module Placer

## Detailed module placement, manually controllable





# Building report – PDF generation

## Unser Angebot



Beispielfirma

Hauptstraße  
Mannheim

Sehr geehrte Damen und Herrn,

es freut uns, dass Sie sich für unser Produkt interessieren. Aufgrund der ersten Daten welche Sie uns zur Verfügung gestellt haben, freuen wir uns Ihnen mitzuteilen, dass wir Ihnen unser exklusives Angebot unterbreiten können. Wesentlicher Zweck unseres Angebotes ist es Sie unabhängiger vom öffentlichen Strombezug zu machen. Mit unserem neuem Produkt "Avalanche" garantieren wir Ihnen für die **nächsten 20 Jahre** einen konstant niedrigen Energiepreis. Unser Team von Experten wird Ihnen die passende Photovoltaikanlage planen, montieren und für die nächsten 20 Jahre warten. - **Sie zahlen nichts!**

Wir bieten Ihnen:

### einen vergünstigten Strompreis

Mit Unterzeichnung der Verträge garantieren wir Ihnen, auf den von der PV-Anlage verbrauchten Energie, einen **FIXEN**, auf die Laufzeit der Verträge gebundenen eingefrorenen Preis von:

**23 ct/kWh**

Sämtliche Angaben entsprechen dem Stand am Tag der Veröffentlichung. Irrtümer sind ausdrücklich vorbehalten. Wir entwickeln unsere Produkte ständig weiter und behalten uns das Recht vor, technische Daten, Spezifikationen, Farben und Preise bis zur Unterzeichnung der effektiven Verträge jederzeit zu ändern.

## Wirtschaftlichkeitsberechnung

Strombedarf: 40.000 kWh/Jahr, Stromkosten: 25 ct/kWh



Sie sparen  
**2980 €/Jahr**  
mit Hilfe der Sonne



Sie sparen  
**59602 €**  
in 20 Jahren



Sie erzeugen  
**12.173 kWh/Jahr**  
erneuerbare Energie



Sie erreichen  
**30 %**  
Unabhängigkeit

## Ihre Vorteile:

- **Bestpreisgarantie** 10% unter den aktuellen Strompreis
- Saubere Stromproduktion vor Ort
- Die PV-Anlage wird von Profis nach Ihren Bedürfnissen maßgeschneidert geplant und fachgerecht installiert
- Für Sie fallen **KEINE Kosten** an
- Sie erhalten von uns ein „**Rundum-Sorglos-Paket**“ - Service, Wartung und Versicherung zum **NULL- Tarif**
- **Fixer Strompreis** - keine Preissteigerung in den nächsten 20 Jahren

## Der Ablauf:

- Wir schließen mit Ihnen einen Dachflächennutzungsvertrag ab
- Wir installieren die PV-Anlage auf Ihrem Dach
- Sie mieten die PV-Anlage wieder von uns und bezahlen dafür eine monatliche Miete. Die Miete entspricht dem aktuellen Stromverbrauch

[www.tetraeder.solar](http://www.tetraeder.solar)



## Das Solarpotenzial Ihres Daches

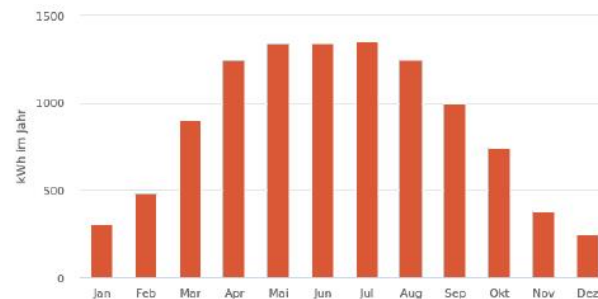
Maximalwerte

|                                     |                       |
|-------------------------------------|-----------------------|
| Geeignete Dachfläche:               | 81 m <sup>2</sup>     |
| Jährl. Ertrag:                      | 12.173 kWh            |
| Jährl. CO <sub>2</sub> -Einsparung: | 5,6 t                 |
| Größe der PV Anlage:                | 12,96 kWp             |
| Adresse:                            | Hauptstraße, Mannheim |



## Ihre monatliche Stromerzeugung im Überblick

Maximalwerte



[www.tetraeder.solar](http://www.tetraeder.solar)



## Einstrahlungsbild



[www.tetraeder.solar](http://www.tetraeder.solar)



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