

Introduction to the system planning with PV*SOL (PV*SOL premium)



Valentin Software

Goals

- On-grid system
- With net metering and electric vehicle
- MeteoSyn
- Load profiles
- Photo Plan, Roof view
- Polymorphic configuration and power optimizers

- For questions, please use the chat function on the right hand side of your screen.



Welcome



PV*SOL premium

Introduction to the program

[New Databases for Databases](#)

[Product Training](#)

[Quick Guide](#)

News about PV*SOL

New online help available!

We are proud to announce that we have published our new help pages now. You can find them [here](#).

Welcome

Find [here](#) some information about your software.

PV*SOL premium - Tutorial video on how to extract Google Earth 3D models with Pan3D and use it in PV*SOL premium.
Click [here](#) to watch the youtube-video.

PV*SOL premium - Tutorial Video on how to create 3D models from 2 photos for PV*SOL premium.
See our [new youtube tutorial](#) on how to create 3D models from 2 photos with Sketchup for PV*SOL premium.

PV*SOL premium - Tutorial Video on polystring and power optimizer connections.
See our [new youtube tutorial](#) on polystring and power optimizer connections.

PV*SOL premium - Hints for the import of 3D models.
[Here](#) you get more information about compatible 3D models.

PV*SOL premium - Extrude buildings by using maps.
Buildings and objects can quickly and easily be created by using floor plans, site plans and map screenshots. For instructions, see the [tutorial](#). A tutorial on working with Google maps can be found [here](#).

[New Project](#)

[Open Project](#)

Recent Projects

[Webinar_PV*SOL_2019_Start_EN](#)

Example Projects

- [3D Barrel Roof](#)
- [3D Bay](#)
- [3D Bifacial PV Modules](#)
- [3D East West Roof](#)
- [3D Map with Polygon Building](#)
- [3D Mesh Import](#)
- [3D Polystring](#)
- [3D Power Optimizer](#)
- [3D Side Wing](#)
- [3D Two Dormers](#)
- [3D Villa with Battery System and Pow...](#)
- [3D Villa with Battery System](#)
- [Battery System](#)
- [Bifacial PV Modules](#)
- [Dual Axis Tracking](#)
- [Electric Vehicle](#)
- [Graphic Roof Coverage](#)
- [Offgrid System 12V](#)
- [Offgrid System with Diesel Generator](#)
- [Offgrid System without Diesel Genera...](#)
- [Photo Plan](#)
- [Solar Park Neuhardenberg ind P90](#)
- [Tracking Comparison](#)

Project Data

System planning 2D
Project Name 12345
Project Number 12345
Project Designer 12345
Start of Operation 1.1.2019

System Type, Climate and Grid

Type of System Grid-connected PV System ...
Climate Data Berlin, DEU
Resolution of the... 1h
AC Mains 230 V, 3-phase, cba n = 1
Maximum Feed in... No

Consumption

Total Consumption 2 kWh
Load Peak 0.8 kW
Resolution of the... 1h

PV Modules

Module Area 1
Module Data Example only 200 W
Manufacturer PV*SOL
Number of PV Mo... 10
PV Generator Ou... 2.4 kWp
Inclination 30°
Orientation 180°
Installation Type Roof parallel

Inverters

Module Area 1
2 x Inverter 1 Example
Manufacturer PV*SOL
Configuration MPPT 1: 1 x 9

Cables

Total Loss 0 % (0 W)

Financial Analysis

Investment Costs 10,400,00 €
From-grid Tariff Net Metering Example Tarif...

Activate Windows
Go to Settings to activate Windows.

Please define the consumption.

Recovered backup copies are available. (File > Backup Copy > Recovered Files)



Welcome



PV*SOL premium

Introduction to the program

[File Operations for Beginners](#)
[Product Training](#)
[Quick Guide](#)

News about PV*SOL

New online help available!
 We are proud to announce that we have published...

Welcome!
 Find [here](#) some information about your software.

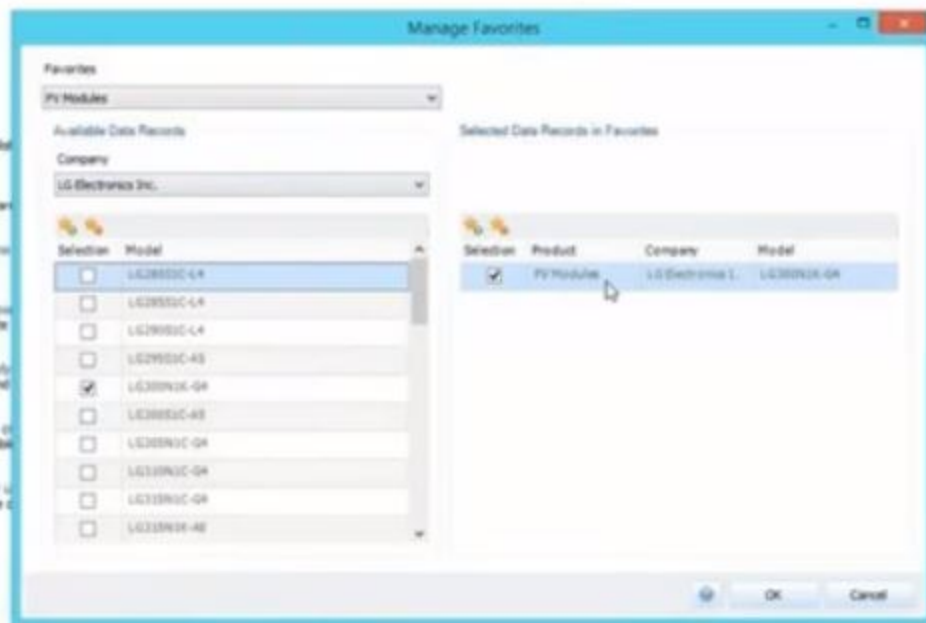
PV*SOL premium - Tutorial video on how
 Click [here](#) to watch the youtube video.

PV*SOL premium - Tutorial Video on how
 See our [new youtube tutorial](#) on how to create...

PV*SOL premium - Tutorial Video on poly
 See our [new youtube tutorial](#) on polystring and...

PV*SOL premium - Hints for the import of
[here](#) you get more information about compatible...

PV*SOL premium - Extrude buildings by u
 Buildings and objects can quickly and easily be c...



- New Project
- Open Project

Recent Projects

Webinar_PV*SOL_2019_Start_EN

Example Projects

- 3D Barrel Roof
- 3D Bay
- 3D Bifacial PV Modules
- 3D East West Roof
- 3D Map with Polygon Building
- 3D Mash Import
- 3D Polystring
- 3D Power Optimizer
- 3D Side Wing
- 3D Two Dormers
- 3D Villa with Battery System and Pow...
- 3D Villa with Battery System
- Battery System
- Bifacial PV Modules
- Dual Axis Tracking
- Electric Vehicle
- Graphic Roof Coverage
- Offgrid System 12V
- Offgrid System with Diesel Generator
- Offgrid System without Diesel Gener...
- Photo Plan
- Solar Park Neuhardenberg incl PKI
- Tracking Comparison

Project Data

Project Name: System planning 20
 Project Number: 12345
 Project Designer: TDS
 Start of Operation: 31.12.2019

System Type, Climate and Grid

Type of System: Grid-connected PV System
 Climate Data: Berlin, D02
 Resolution of the...: 1h
 AC Mains: 230 V, 3-phase, size p + 1
 Maximum Feed-in...: No

Consumption

Total Consumption: 0 kWh
 Load Peak: 0.0 kWh
 Resolution of the...: 1h

PV Modules

Module Area 1: Example poly 200 W
 Module Data: PV*SOL
 Manufacturer: PV*SOL
 Number of PV Mo...: 0
 PV Generator Ou...: 0.4 kWhp
 Inclination: 30°
 Orientation: 180°
 Installation Type: Roof parallel

Inverters

Module Area 1: Example
 2 x Inverter 1: PV*SOL
 Manufacturer: PV*SOL
 Configuration: MPPT 1: 1 x 2

Cables

Total Loss: 0 % (0 W)

Financial Analysis

Investment Costs: 10,400.00 €
 From-grid Tariff: Net Metering Example Tariff...

Activate Windows
 Go to Settings to activate Windows.



Project Data

Project Number: 12345
Project Designer: TSO

Customer Details

Customer Number: 555-222
Contact Person: Fr. Sonne
Company: Solar Power
Phone: +49 (0)8 (52) 444 000
Fax: +49 (0)8 (52) 444 000
E-Mail: sonne@solar.net
Address: Zorngießsien 1
26111 Delft
Netherlands

Start of Operation: 31.01.2019
Project Name: System planning 20
Project Image:



Load Delete

Project Description: PV System with electrical appliances and electric vehicle

Address of Installation:

Project Data

Project Name: System planning 20
Project Number: 12345
Project Designer: TSO
Start of Operation: 31.01.2019

System Type, Climate and Grid

Type of System: Grid-connected PV System ...
Climate Data: Berlin, DEU
Resolution of the...: 1 h
AC Name: 230 V, 3-phase, cos φ = 1
Maximum Feed-in...: No

Consumption

Total Consumption: 9.9 kWh
Load Peak: 5.0 kW
Resolution of the...: 1 h

PV Modules

Module Area 1: Example poly 200 W
Module Data: PV*SO
Manufacturer: PV*SO
Number of PV Modules: 38
PV Generator Output: 7.6 kWp
Inclination: 30°
Orientation: 180°
Installation Type: Roof parallel

Inverters

Module Area 1: 2 x Inverter 1
Inverter Data: Example
Manufacturer: PV*SO
Configuration: MPPT 1: 1 x 5

Cables

Total Loss: 0 % (0 W)

Financial Analysis

Investment Costs: 10,400,00 €
From-grid Tariff: Net Metering Example Tariff...

Activate Windows
Go to Settings to activate Windows.



System Type, Climate and Grid

Type of System

Grid-connected PV system with Electrical Appliances and Electric Vehicles



Type of Design

☐ Use 3D Design

Climate Data

Country	Location		
Germany	Berlin		
Latitude	52° 31' 30" (52,525°)	Annual sum of global irradiation	1020 kWh/m²
Longitude	13° 24' 48" (13,415°)	Annual Average Temperature	9,3 °C
Time zone	UTC+1	Simulation Parameters	
Time Period	1991 - 2010		
Resolution	Hourly		

AC Mains



Voltage D.N.D.	230 V
Number of Phases	3-phase
AC M	1
Maximum Feed-in Power Clipping	No



Project Data

Project Name	System planning 20
Project Number	12345
Project Designer	100
Start of Operation	31.03.2018

System Type, Climate and Grid

Type of System	Grid-connected PV syst...
Climate Data	Berlin, DEU
Resolution of the...	1h
AC Mains	230 V, 3-phase, one p...
Maximum Feed-in...	No

Consumption

Total Consumption	0 kWh
Load Peak	0.0 kW
Resolution of the...	1h

PV Modules

Module Area 1	Example poly 200 W
Module Data	Example poly 200 W
Manufacturer	PV*SOL
Number of PV Mo...	10
PV Generator Co...	2.4 kWp
Inclination	30°
Orientation	180°
Installation Type	Roof parallel

Inverters

Module Area 1	Example
2 x Inverter 1	Example
Manufacturer	PV*SOL
Configuration	HPV 1/ 2 x 9

Electric vehicles

Electric vehicle	BMW i2 - 23kWh
No. of vehicles	1
Charging Power	3,7 kW
Battery Capacity	21,6 kWh
Range in accords...	100 km

Cables

Total Loss	0 % (0 W)
------------	-----------

Financial Analysis

Investment Costs	10.400,00 €
From-grid Tariff	Net Metering Example ...

Activate Windows
Go to Settings to activate Windows.

Please define the consumption.

Recovered backup copies are available. (File > Backup Copies > Recovered Files)

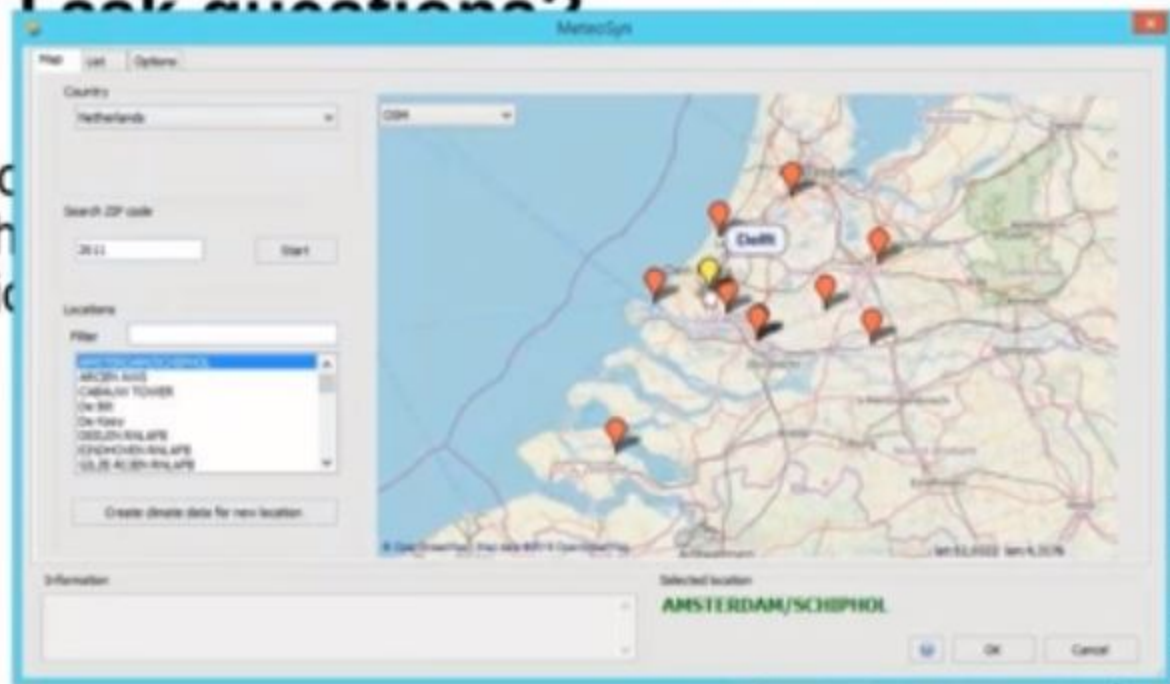
- For each side

Webinar ID: 146-707-227

Go to Settings to

Can I ask questions?

- For
- ch
- si



Webinar ID: 146-787-227

GoToWebinar

MetecSyn - Create climate data for a new location

Country:

Data source:

Search:

☐ Location ☐ Latitude

☒ ZIP code

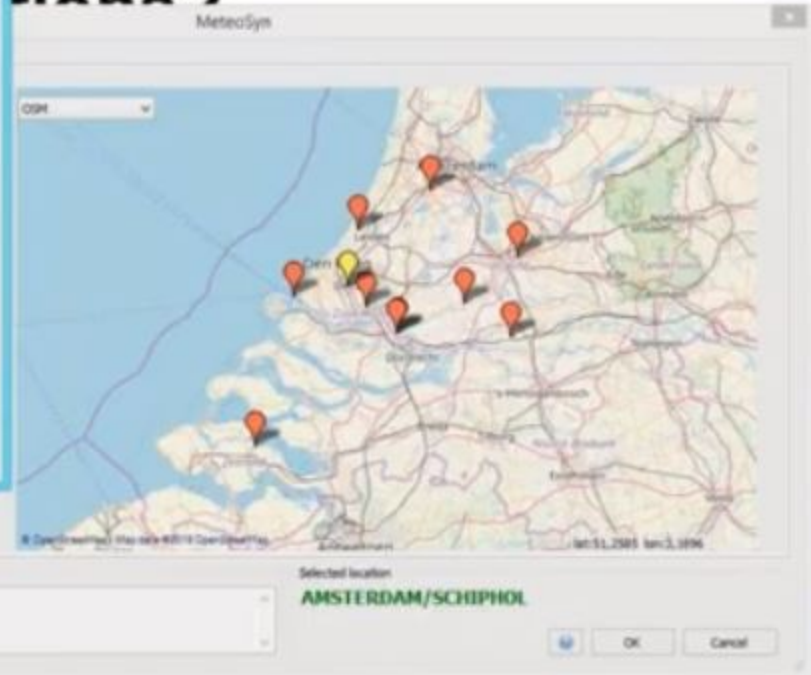
Location:

State:

ZIP code:

Date: ☐ MetecSyn ☒ Measurement data

Month	Global radiation W/m² (Eko)	Mean outside temperature No input
Jan	\$6,00	
Feb	\$6,00	
Mar	\$6,00	
Apr	\$6,00	
May	\$6,00	
Jun	\$6,00	
Jul	\$6,00	
Aug	\$6,00	
Sep	\$6,00	
Oct	\$6,00	
Nov	\$6,00	
Dec	\$6,00	



Webinar ID: 146-707-227

GoToWebinar



Project Data

Project Name: System planning 20
Project Number: 12345
Project Designer: TSE
Start of Operation: 31.03.2019

System Type, Climate and Grid

Type of System: Grid-connected PV syst...
Climate Data: Delft, NL
Resolution of the...: 1 h
AC Name: 230 V, 3-phase, 100 A
Maximum Feed-in...: No

Consumption

Total Consumption: 0 kWh
Load Peak: 0,0 kW
Resolution of the...: 1 h

PV Modules

Module Area 1:
Module Data: Example only 200 W
Manufacturer: PV*SOL
Number of PV Mo...: 10
PV Generator Co...: 3,6 kVp
Inclination: 30°
Orientation: 180°
Installation Type: Roof parallel

Inverters

Module Area 1:
2 x Inverter 1: Example
Manufacturer: PV*SOL
Configuration: MPPT 1: 1 x 5

Electric vehicles

Electric vehicle: BMW i3 - 23kWh
No. of vehicles: 1
Charging Power: 3,7 kW
Battery Capacity: 23,8 kWh
Range in accords...: 190 km

Cells

Total Loss: 0 % (0 W)

Financial Analysis

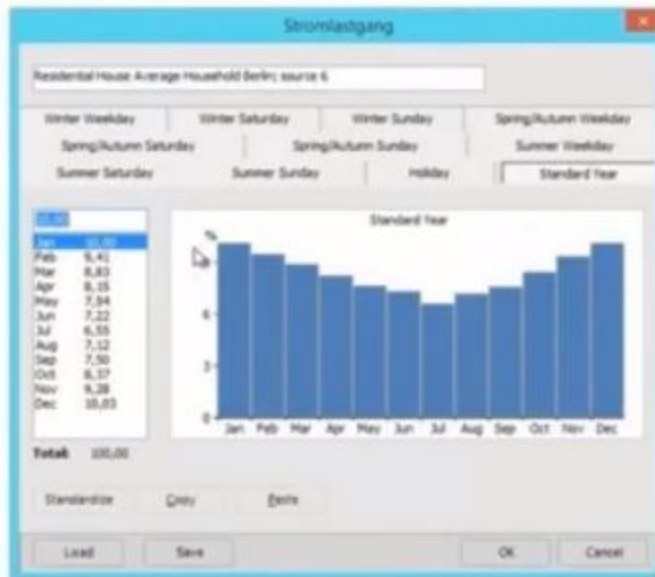
Investment Costs: 1.500,00 €/kWp
Feed-in Tariffs: 0,00 €/kWh (incl.) - Details...

Consumption

NONE

ENERGY 20 kWh

New Appliance



Energy in kWh

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Annual Consumption: 0 kWh
Load Peak: 0,0 kW



Project Data

Project Name	System planning 20
Project Number	12345
Project Designer	123
Start of Operation	31.03.2019

System Type, Climate and Grid

Type of System	Grid-connected PV syst...
Climate Data	Grid, H2
Resolution of the...	1 h
AC Name	230 V, 3-phase, 50 Hz
Maximum Feed-in...	No

Consumption

Total Consumption	4000 kWh
Load Peak	1,2 kW
Resolution of the...	1 h

PV Modules

Module Area 1	Example only 200 m²
Module Data	Example only 200 m²
Manufacturer	PIVOS
Number of PV Mo...	10
PV Generator Co...	2.4 Vmp
Inclination	30°
Orientation	00°
Installation Type	Roof-mounted

Inverters

Module Area 1	Example
2 x Inverter 1	Example
Manufacturer	PIVOS
Configuration	MPPT 1 x 1

Electric vehicles

Electric vehicle	BMW i3 - 230 kWh
No. of vehicles	1
Charging Power	2,7 kW
Battery Capacity	21,6 kWh
Range in accords...	350 km

Summary

Electricity	0 kWh
Total Loss	0 kWh
Investment Costs	1.500,00 €
Feed-in Tariffs	0,00 €

Activate Windows
Go to Settings to activate Windows.

Annual Consumption 4000 kWh
Load Peak 1,2 kW

Consumption

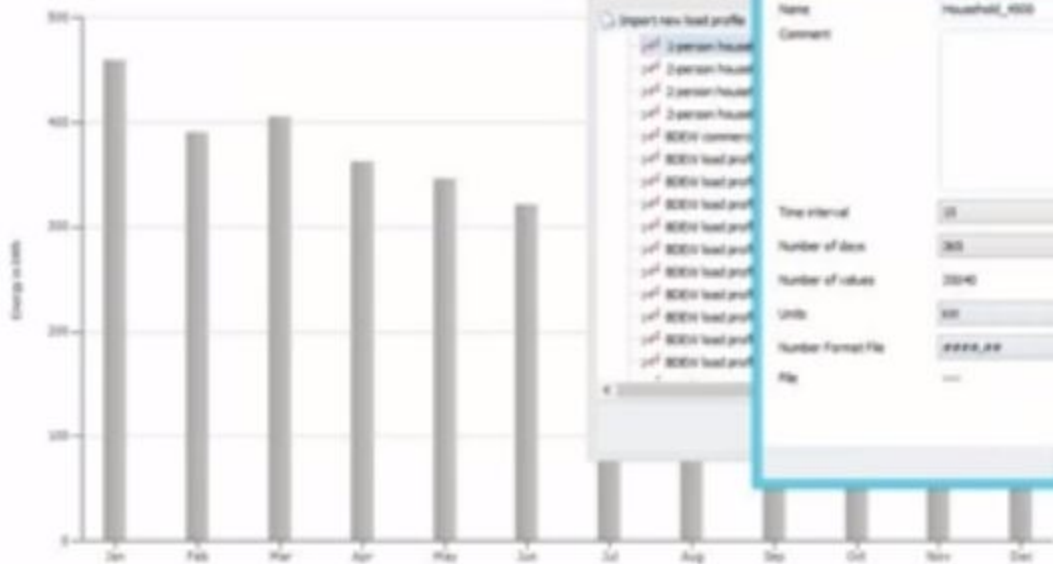
NAME

ENERGY IN kWh

4000

Load Profile 1

New Appliance



800 load profile 1

Import new load profile

Name	Household_4000
Comment	
Time interval	15 min
Number of days	365
Number of values	5540
Units	kWh
Number Format File	####.##
File	

OK Cancel

Model	Company	Nominal output(W)	MPP voltage(V)	MPP Current (A)	User created Data Record	Available	Maximum System voltage(V)
US000001-1.4	US Electronics Inc.	200	31.8	6.3	No	Yes	1000
US000002-1.4	US Electronics Inc.	200	31.8	6.30	No	Yes	1000
US000003-1.4	US Electronics Inc.	200	31.8	6.1	No	Yes	1000
US000004-4.5	US Electronics Inc.	200	31.8	6.30	No	Yes	1000
US000005-04	US Electronics Inc.	300	32.8	9.20	No	Yes	1000
US000006-4.5	US Electronics Inc.	300	31.7	9.47	No	Yes	1000
US000007-04	US Electronics Inc.	300	32.8	9.20	No	Yes	1000
US000008-04	US Electronics Inc.	300	32.8	9.40	No	Yes	1000
US000009-04	US Electronics Inc.	300	32.3	9.40	No	Yes	1000
US000010-4.5	US Electronics Inc.	300	32.9	9.20	No	Yes	1000
US000011-04	US Electronics Inc.	300	32.8	9.50	No	Yes	1000
US000012-4.5	US Electronics Inc.	300	32.3	9.60	No	Yes	1000
US000013-4.5	US Electronics Inc.	300	32.3	9.60	No	Yes	1000
US000014-4.5	US Electronics Inc.	300	32.3	9.77	No	Yes	1000
US000015-4.5	US Electronics Inc.	300	32.7	9.8	No	Yes	1000
US000016-4.5	US Electronics Inc.	300	32.3	9.87	No	Yes	1000
US000017-4.5	US Electronics Inc.	300	34	9.20	No	Yes	1000
US000018-4.5	US Electronics Inc.	340	34.3	9.80	No	Yes	1000
US000019-4.5	US Electronics Inc.	340	36.4	9.20	No	Yes	1000
US000020-4.5	US Electronics Inc.	340	36.7	9.40	No	Yes	1000
US000021-4.5	US Electronics Inc.	350	36.3	9.7	No	Yes	1000
US000022-4.5	US Electronics Inc.	350	37.1	9.40	No	Yes	1000
US000023-4.5	US Electronics Inc.	350	36.2	9.70	No	Yes	1000
US000024-4.5	US Electronics Inc.	350	37.4	9.5	No	Yes	1000
US000025-4.5	US Electronics Inc.	340	36.3	9.87	No	Yes	1000
US000026-4.5	US Electronics Inc.	360	37.7	9.50	No	Yes	1000
US000027-4.5	US Electronics Inc.	360	36.7	9.80	No	Yes	1000
US000028-4.5	US Electronics Inc.	360	38	9.50	No	Yes	1000
US000029-4.5	US Electronics Inc.	390	36.8	9.50	No	Yes	1000
US000030-4.5	US Electronics Inc.	390	40.2	9.80	No	Yes	1000
US000031-4.5	US Electronics Inc.	400	40.8	9.80	No	Yes	1000

☐ Only show user created data records
 ☐ Show products that are not available, too

Activate Windows
 Go to Settings to activate Windows.



PV Modules



Module Area 1

Shading

Degradation of Module

Company

LG Electronics Inc.

Model

LG200H1-G4

☒ Selection only from Manufacturer☐ Photo Plan - Photo provider of roof coverage☐ Graphic Coverage

Number of PV Modules

10

5,40

Wp

Default Settings Consumption

Installation Type

Roof parallel

Tracking

None

Inclination

30°

Orientation

0°



Azimuth 0°

Additional Parameters

 PV Generator Output 5,40Wp
 PV Generator Surface 20,0 m²


Project Data

 Project Name System planning 20
 Project Number 12345
 Project Designer TSC
 Start of Operation 31.01.2019

System Type, Climate and Grid

 Type of System Grid-connected PV syst...
 Climate Data DWH, AGD
 Resolution of the... 1 h
 AC Name 230 V, 3-phase, 50 Hz
 Maximum Feed-in... 10

Consumption

 Total Consumption 4000 kWh
 Load Peak 3,2 kW
 Resolution of the... 15 min

PV Modules

 Module Area 1
 Module Data LG200H1-G4
 Manufacturer LG Electronics Inc.
 Number of PV Mo... 10
 PV Generator Ou... 5,40Wp
 Inclination 30°
 Orientation 0°
 Installation Type Roof parallel

Inverters

 Module Area 1
 2 x Inverter 1 Example
 Manufacturer PV*SOL
 Configuration 1000 V / 1 x 5

Electric vehicles

 Electric vehicle 1000 V / 230V
 No. of vehicles 1
 Charging Power 3,7 kW
 Battery Capacity 20,0 kWh
 Range in electric... 100 km

Grids

Total Loss 0 % (0,00)

Financial Results

Investment Costs 1.500,00 EUR

Feed-in Tariffs 0,00 EUR/kWh

- Inverter 1:** Maximum inverter power of 2,0 kW exceeded (Currently: 2,7 kW)
- With dimensioning factors exceeding 100 % (B/C/D) simulation with minute values is recommended. These functions can be activated in the "Simulation Parameters" dialog under "System Type, Climate and Grid".
- The selected feed-in tariff is not valid for the country in which the climate data record is located.
- Recovered backup copies are available. (File > Backup Copy > Recovered Files)

 Activate Windows
 Go to Settings to activate Windows.



PV Modules



- Module Area 1
- Shading
- Degradation of Module

Company: LG Electronics Inc. Model: LG300N1K-G4

☒ Selection only from Catalogue

☐ Photo Plan - Photo preview of roof coverage

☐ Graphic Coverage

Number of PV Modules: 18 5,40 kWp

Installation Type: Roof parallel

Tracking: Single North-South Axis

Rotation Axis Incline: 30°

Rotational Angle of Opening: 20°

☒ Backtracking

Surface Usage Factor: 0,4

Detected Ratio to Consumption



The angles in the graph are for illustration only.

Additional Information

PV Generator Output
PV Generator Surface

5,4 kWp
26,3 m²



Project Data

Project Name: System planning 20
Project Number: 12345
Project Designer: TSI
Start of Operation: 31.01.2019

System Type, Climate and Grid

Type of System: Grid-connected PV syst...
Climate Data: DnR, 182
Resolution of the...: 1 h
AC Name: 230 V, 2-phase, one p...
Maximum Feed-in...: No

Consumption

Total Consumption: 4000 kWh
Load Peak: 1,2 kW
Resolution of the...: 15 min

PV Modules

Module Area 1
Module Data: LG300N1K-G4
Manufacturer: LG Electronics Inc.
Number of PV Mo...: 18
PV Generator Co...: 5,4 kWp
Tracking: Single North-South Axis
Rotation Axis Incl...: 30°
Installation Type: Roof parallel

Inverters

Module Area 1
2 x Inverter 1: Example
Manufacturer: PV*SOL
Configuration: HPP 1: 1 x 5

Electric vehicles

Electric vehicle: BMW i3 - 23kWh
No. of vehicles: 1
Charging Power: 3,7 kW
Battery Capacity: 21,6 kWh
Range in accords...: 190 km

Cables

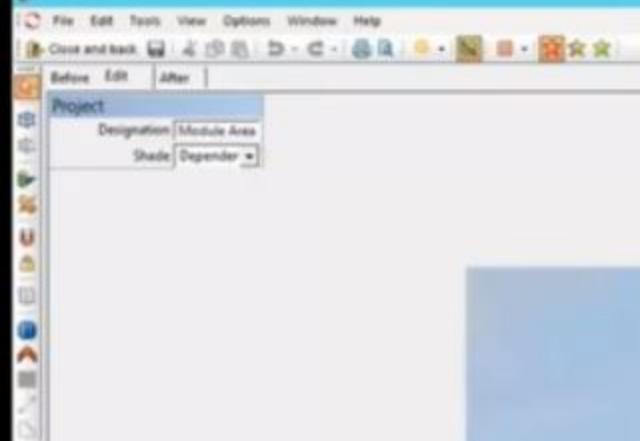
Total Loss: 0 % (0 W)

Financial Analysis

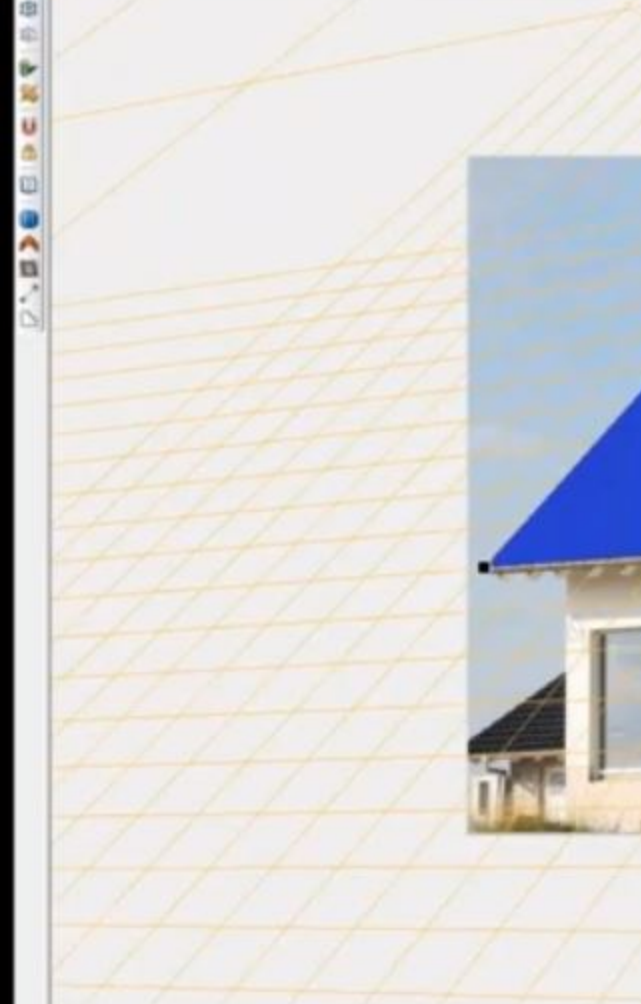
Investment Costs: 1.500,00 EUR
Feed-in Tariffs: 800 2019 (H4) - Gebau...

- Inverter 1: Maximum inverter power of 1,2 kW exceeded (Currently: 1,7 kW)
- With dimensioning factors exceeding 120 % (DC/AC) simulation with module values is recommended. These functions can be activated in the "Simulation Parameters" dialog under "System Type, Climate and Grid".
- The selected feed-in tariff is not valid for the country in which the climate data record is located.
- Recovered backup copies are available. (File > Backup Copies > Recovered Files)

Activate Windows
Go to Settings to activate Windows.



Activate Windows
Go to Settings to activate Windows.



Product choice, solar area

LG 300N1X-G4 Border Color: white
LG 300N1X-G4 Border Color: matt white
LG 300N1X-G4 Border Color: grey
LG 300N1X-G4 Border Color: matt grey
LG 300N1X-G4 Border Color: coal
LG 300N1X-G4 Border Color: matt coal
LG 300N1X-G4 Border Color: black
LG 300N1X-G4 Border Color: matt black

☐ rotate module by 90 degrees

module spacing
horizontal
vertical

☒ Show preview

OK Cancel

Product choice

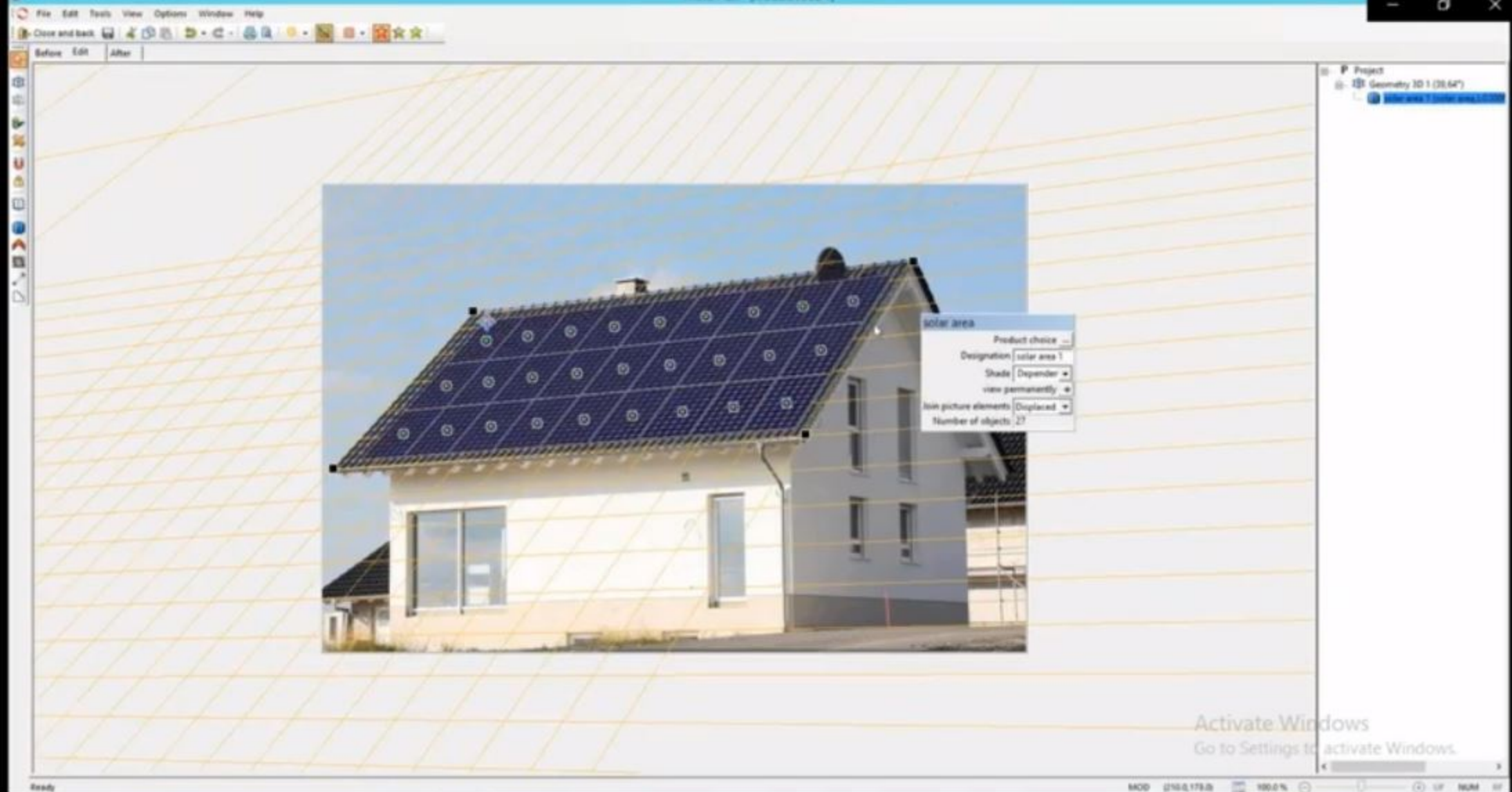
rotation: solar area 1

Shade: Dependent

view permanently: ☒

elements: Displaced

objects: 0



Inverters									
Enter Asterisk (*) for Wildcard Search									
Product	Model	Company	No. of MPPT Trackers	AC Power Rating [kW]	Nom. DC Voltage [V]	MPPT Min. MPPT Voltage [V]	MPPT Max. MPPT Voltage [V]	User-created Data Record	Available
☐	☒ SHP 125-US-20	SHA Solar Technology AG	1	125	700	584	1000	No	Yes
☐	☒ SHP 150-20	SHA Solar Technology AG	1	150	800	600	1000	No	Yes
☐	☒ SHP 150-US-20	SHA Solar Technology AG	1	150	800	600	1000	No	Yes
☐	☒ SHP 75-10	SHA Solar Technology AG	1	75	570	570	800	No	Yes
☐	☒ SHP 40-10	SHA Solar Technology AG	1	40	570	570	800	No	Yes
☒	☒ STP3.0-34V-40	SHA Solar Technology AG	2	3	340	125	800	No	Yes
☒	☒ STP4.0-34V-40	SHA Solar Technology AG	2	4	340	125	800	No	Yes
☒	☒ STP5.0-34V-40	SHA Solar Technology AG	2	5	340	125	800	No	Yes
☒	☒ STP6.0-34V-40	SHA Solar Technology AG	2	6	340	125	800	No	Yes
☒	☒ Sunny Boy 3.0-EU-40	SHA Solar Technology AG	1	3.0	360	90	400	No	Yes
☒	☒ Sunny Boy 2.5-EU-40	SHA Solar Technology AG	1	2.5	360	90	400	No	Yes
☒	☒ Sunny Boy 240	SHA Solar Technology AG	1	3.23	39	32	32	No	Yes
☒	☒ Sunny Boy 2500TL-27-21	SHA Solar Technology AG	1	2.5	400	125	800	No	Yes
☒	☒ Sunny Boy 3.0-34V-40	SHA Solar Technology AG	2	3	340	125	800	No	Yes
☒	☒ Sunny Boy 3.0-34V-40	SHA Solar Technology AG	2	3.0	360	100	500	No	Yes
☒	☒ Sunny Boy 3000TL-21	SHA Solar Technology AG	2	3	400	125	800	No	Yes
☒	☒ Sunny Boy 3000TL-27-21	SHA Solar Technology AG	1	3	400	125	800	No	Yes
☒	☒ Sunny Boy 3000 Smart Energy	SHA Solar Technology AG	2	3.68	400	125	800	No	Yes
☒	☒ Sunny Boy 3000TL-21	SHA Solar Technology AG	2	3.68	400	125	800	No	Yes
☒	☒ Sunny Boy 4.0-34V-40	SHA Solar Technology AG	2	4	360	140	800	No	Yes
☒	☒ Sunny Boy 4000TL-21	SHA Solar Technology AG	2	4	400	125	800	No	Yes
☒	☒ Sunny Boy 5.0-34V-40	SHA Solar Technology AG	2	5	360	170	800	No	Yes
☒	☒ Sunny Boy 5000 Smart Energy	SHA Solar Technology AG	2	4.8	400	125	800	No	Yes
☒	☒ Sunny Boy 5000TL-21	SHA Solar Technology AG	2	4.8	400	125	800	No	Yes
☐	☒ Sunny Central SC 1000 CP XT	SHA Solar Technology AG	1	1000	520	590	800	No	Yes
☐	☒ Sunny Central SC 2000	SHA Solar Technology AG	1	2200	570	570	1000	No	Yes
☐	☒ Sunny Central SC 2000	SHA Solar Technology AG	1	2475	600	640	1400	No	Yes
☐	☒ Sunny Central SC 900 CP-3P	SHA Solar Technology AG	1	900	500	500	800	No	Yes
☐	☒ Sunny Central SC 900 CP XT	SHA Solar Technology AG	1	900	480	480	800	No	Yes
☐	☒ Sunny Central SC 930 CP-3P	SHA Solar Technology AG	1	930	500	500	800	No	Yes
☐	☒ Sunny Central SC 930 CP XT	SHA Solar Technology AG	1	930	500	500	800	No	Yes
☐	☒ Sunny Central SC 720 CP XT	SHA Solar Technology AG	1	720	500	480	800	No	Yes
☐	☒ Sunny Central SC 760 CP XT	SHA Solar Technology AG	1	760	500	500	800	No	Yes
☐	☒ Sunny Central SC 800 CP-3P	SHA Solar Technology AG	1	800	520	500	800	No	Yes
☐	☒ Sunny Central SC 800 CP XT	SHA Solar Technology AG	1	800	520	520	800	No	Yes
☐	☒ Sunny Central SC 850 CP XT	SHA Solar Technology AG	1	850	620	640	800	No	Yes



Project Data

Project Name	System planning 20
Project Number	12345
Project Designer	100
Start of Operation	31.03.2019

System Type, Climate and Grid

Type of System	Grid-connected PV syst...
Climate Data	DEUT, 16.0
Resolution of the...	1 h
AC Meters	230 V, 3-phase, 50 Hz
Maximum Feed-in...	No

Consumption

Total Consumption	4000 kWh
Load Peak	1.2 kW
Resolution of the...	15 min

PV Modules

Module Area 1	1.000000 m²
Module Data	1.000000 m²
Manufacturer	1.0 Electronics Inc.
Number of PV Mo...	20
PV Generator Co...	1.0 kWp
Orientation	40°
Inclination	30°
Installation Type	Roof parallel

Inverters

Module Area 1	1.000000 m²
1 x Inverter 1	1.000000 m²
Manufacturer	1.0 Solar Technology AG
Configuration	1.000000 m²

Electric vehicles

Electric vehicle	Mercedes-Benz E 250 e
No. of vehicles	1
Charging Power	2.0 kW
Battery Capacity	20 kWh
Range in accorda...	200 km

Financial Analysis

Investment Costs	1.000,00 €
...	...

Financial Analysis

Financial Analysis Parameters

Energy Balance/Feed-in Concept

Price of Electricity sold to Third Party

Applied Feed-in Tariffs

Inflation Rate for Feed-in / Export Tariff

Feed-in Tariff

Inflation Rate for Energy Price

Set

Surplus Feed-in

0,000 €/kWh

Info Tariff Name

BEE 2018 (H) - Gelddarlehens

0,0 %/year

Example - Example Private (Comme

0,0 %/year

Economic Efficiency Calculation

General Parameters

Income and expenditure

Investment Costs

Financing

Tax

Income and expenditure

Tax deductible Outgoing cost of system (incl. parts and labour)

Non-tax deductible Outgoing cost of system (incl. parts and labour)

Incoming subsidies

Outgoing annual Operating Costs

Annual Consumption Costs

Outgoing other annual costs

Incoming other annual income/savings

Detailed Entry

Detailed Entry

Detailed Entry

Detailed Entry

Detailed Entry

Detailed Entry

Detailed Entry

< Back

Continue >

Close

Help



Project Data

Project Name	System planning 20
Project Number	12345
Project Designer	100
Start of Operation	31.01.2019

System Type, Climate and Grid

Type of System	Grid-connected PV syst...
Climate Data	Griff, AG
Resolution of the...	1 h
AC Mains	230 V, 3-phase, 50 Hz
Maximum Feed-in...	No

Consumption

Total Consumption	4500 kWh
Load Peak	5,2 kW
Resolution of the...	15 min

PV Modules

Module Area 1	16300 Wp / 44
Module Data	LG330P41-G4
Manufacturer	LG Electronics Inc.
Number of PV Mo...	25
PV Generator Co...	7,5 Vmp
Inclination	40°
Orientation	180°
Installation Type	Roof parallel

Inverters

Module Area 1	1 x Inverter 1
1 x Inverter 1	Sunny Tripower 7000TL...
Manufacturer	SMA Solar Technology AG
Configuration	HPP 1: 1 x 12 HPP 2: 1 x 12

Electric vehicles

Electric vehicle	Mercedes-Benz e 250 e
No. of vehicles	1
Charging Power	2 kW
Battery Capacity	28 kWh
Range in accords...	200 km

Activate Windows
Go to Settings to activate Windows.

Financial Analysis

Investment Costs	1,200,00 € (kWh)
------------------	------------------

Results

- Overview
- Simulation
 - Diagram Editor
 - Energy Flow Graph
 - Results per Module Area
 - Production Forecast with consumption
 - Production Forecast per Inverter
 - Performance Ratio (PR) per Inverter
 - Irradiance per module area
 - PV energy during observation period
 - Temperature per module area
 - SOC Electric vehicle
- PV System Energy Balance
 - Configuration
- Financial Analysis
 - Cashflow Table
 - Energy Supply Account
 - Electricity cost saving
 - Accrued Cash Flow (Cash-Balance)
 - Electricity Cost Trend (Price Increase Rate 2 %)

Financial Analysis

Revenue or Savings	1286,2 €/year
Accrued Cash Flow (Cash-Balance)	18,106,09 €
System Integration	
Energy from Grid	\$ kWh/year

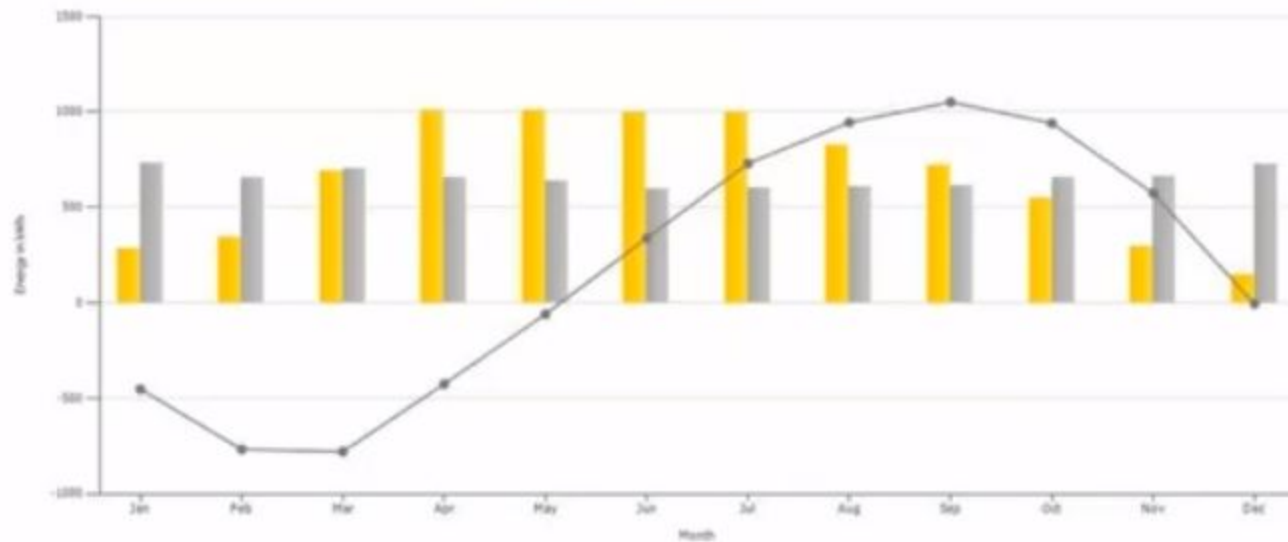
Tech. Quality of the PV System

PV Generator Energy (AC grid)	7,862 kWh/year
Spec. Annual Yield	1,046,29 kWh/kWp
Performance Ratio (PR)	89,3 %

Production Forecast

Electricity cost saving

Production Forecast with consumption



■ PV Generator Energy (AC grid) ■ Appliances — Cumulative total energy generation



Results

- Overview
- Simulation
 - Diagram Editor
 - Energy Flow Graph
 - Results per Module Area
 - Production Forecast with consumption
 - Production Forecast per Inverter
 - Performance Ratio (PR) per Inverter
 - Irradiance per module area
 - PV energy during observation period
 - Temperature per module area
 - SOC Electric vehicle
- PV System Energy Balance
- Configuration
- Financial Analysis
 - Cashflow Table
 - Energy Supply Account
 - Electricity cost saving
 - Accrued Cash Flow (Cash-Balance)
 - Electricity Cost Trend (Price Increase Rate 2 %)

PV System

PV Generator Output	7,5 kWp
Spec. Annual Yield	1,046,25 kWh/kWp
Performance Ratio (PR)	85,5 %
PV Generator Energy (AC grid)	7,862 kWh/year
Down-regulation at Feed-in Point	0 kWh/year
CO ₂ -Emissions avoided	4,717 kg / year

Appliances

Appliances	4,300 kWh/year
Standby Consumption (Inverter)	22 kWh/year
Charge of the electric vehicle	5,346 kWh/year
Total Consumption	7,867 kWh/year
covered by PV power	2,046 kWh/year
covered by grid	5,320 kWh/year
covered by electric vehicle	0 kWh/year
Energy from Grid	5,1 kWh/year
Solar Fraction	94,5 %

Electric vehicle

Charge at beginning	20 kWh
Charge of the electric vehicle (Total)	5,346 kWh/year
Charge of the electric vehicle (PV System)	777 kWh/year
Charge of the electric vehicle (Grid)	2,369 kWh/year
Discharging the electric vehicle for consumption	0 kWh/year
Losses due to charging/discharging	83 kWh/year
Losses in Battery	26,1 kWh/year
Consumption due to kilometres driven	2030 kWh
Mileage per year	18250 km
of which is solar	4236 km

Level of Self-sufficiency

Total Consumption	7,867 kWh/year
covered by grid	5,320 kWh/year
Level of Self-sufficiency	32,4 %



Project Data

Project Name	System planning 20
Project Number	12345
Project Designer	750
Start of Operation	31.01.2019

System Type, Climate and Grid

Type of System	Grid-connected PV syst...
Climate Data	0 kWh, 16,0
Resolution of the...	1 h
AC Mains	230 V, 3 phase, one p...
Maximum Feed-in...	No

Consumption

Total Consumption	4000 kWh
Load Peak	5,2 kW
Resolution of the...	15 min

PV Modules

Module Area 1	1,0339141 m ²
Module Data	1,0339141 m ²
Manufacturer	LG Electronics Inc.
Number of PV Mo...	23
PV Generator Co...	7,5 kWp
Inclination	40°
Orientation	180°
Installation Type	Roof parallel

Inverters

Module Area 1	1 x Inverter 1
Manufacturer	Sunny Tripower 7000TL...
Configuration	094 Solar Technology AG
	HPP 1: 1 x 12
	HPP 2: 1 x 12

Electric vehicles

Electric vehicle	Mercedes-Benz B 250 e
No. of vehicles	1
Charging Power	3 kW
Battery Capacity	28 kWh
Range in accords...	300 km

Cables

Total Loss	10,21 % (0,4 kWh)
------------	-------------------

Financial Analysis

Investment Costs	1,200,00 EUR
------------------	--------------



PV Modules



- Module Area 1
 - Shading
 - Degradation of Module
- Module Area 2
 - Shading
 - Degradation of Module

Company

US-Elctronica

Selection

Photo Plot

Graphic C

Plot

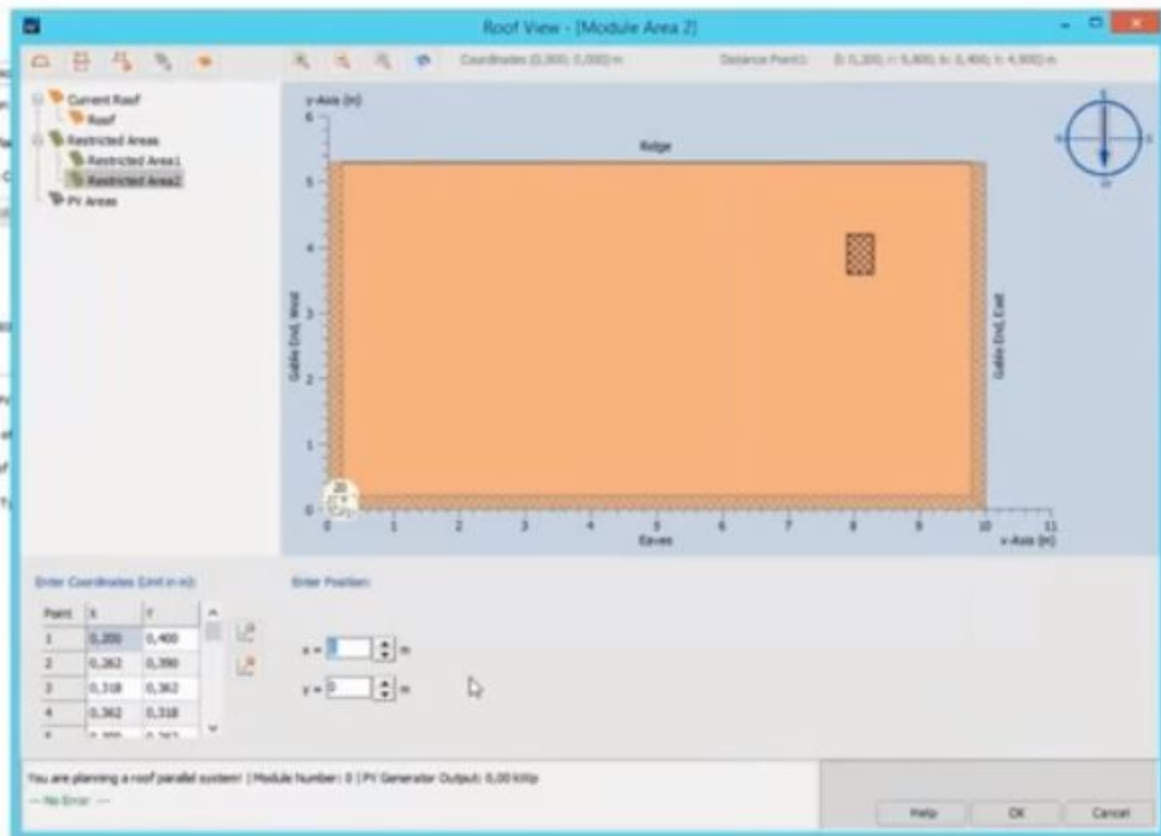
Additional Data

Number of PV

Orientation of

Inclination of

Installation Ty



Project Data

System planning 2D
Project Name
Project Number
Project Designer
Start of Operation

System Type, Climate and Grid

Type of System
Climate Data
Resolution of the...
AC Mains
Maximum Feed-in...

Consumption

Total Consumption
Load Peak
Resolution of the...

PV Modules

Module Area 1
Module Data
Manufacturer
Number of PV Mo...
PV Generator Ou...
Inclination
Orientation
Installation Type

Module Area 2

Inverters

Module Area 1
1 x Inverter 1
Manufacturer
Configuration

Module Area 2

Electric vehicles

Electric vehicle
No. of vehicles
Charging Power
Battery Capacity
Range in accords...
Cables
Total Loss

PV Generator Output
PV Generator Surface

0,00 kWp
0,00 m²

Activate Windows
Go to Settings to activate Windows.

- Configuration 2, Inverter 1: Maximum inverter power of 2,36 kW exceeded (Current: 2,74 kW)
- Configuration 2: With dimensioning factors exceeding 125 % (DC/AC) simulation with minute values is recommended. These functions can be activated in the "Simulation Parameters" dialog under "System Type, Climate and Grid".
- Recovered backup copies are available. (File > Backup Copies > Recovered Files)



PV Modules

- Module Area 1
 - Shading
 - Degradation of Module
- Module Area 2
 - Shading
 - Degradation of Module

Company

LG Electronics

☒ Selection

☐ Photo Plot

☒ Graphic C

☒ 3D

☐ 2D

☐ 1D

☐ 0D

☐ 0D

☐ 0D

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Roof View - [Module Area 2]

New 2D Object

Selected Object: PV Area

Standard Forms:

- ☒ Rectangle

a: b:
- ☐ Trapezium

a: b: c: h:
- ☐ Triangle

a: h:
- ☐ Fit to Roof Area
- ☐ Based on Number of Modules

Number of Modules in X Direction:

Number of Modules in Y Direction:

Resulting Power: 3.76 kWp

☐ Cover Roof Afterwards

Reference: PV Area

Help OK Cancel

You are planning a roof panel
— No Error —

PV Generator Output 12.8 kWp
PV Generator Surface 30.3 m²



Project Data

Project Name: System planning 2D
Project Number: 12345
Project Designer: TSD
Start of Operation: 31.01.2019

System Type, Climate and Grid

Type of System: Grid-connected PV syst...
Climate Data: GHI, H2O
Resolution of the...: 1 h
AC Mains: 230 V, 3-phase, 50 Hz
Maximum Feed-in: No

Consumption

Total Consumption: 4500 kWh
Load Peak: 3.2 kW
Resolution of the...: 15 min

PV Modules

Module Area 1
Module Data: LG 350W 16-G4
Manufacturer: LG Electronics Inc.
Number of PV Mo...: 25
PV Generator Ou...: 3.7 kWp
Inclination: 40°
Orientation: 180°
Installation Type: Roof parallel

Inverters

Module Area 1
1x Inverter 1: Sunny Tripower 7000TL...
Manufacturer: SMA Solar Technology AG
Configuration: MPPT 1: 1 x 12
MPPT 2: 1 x 12

Electric vehicles

Electric vehicle: Mercedes-Benz S 250 e
No. of vehicles: 1
Charging Power: 11 kW
Battery Capacity: 28 kWh
Range in accords...: 300 km

Cables

Total Loss: 0.18 % (24 W)

Configuration 2, Inverter 1: Maximum inverter power of 2.38 kW exceeded (Currently: 3.7 kW)

Configuration 2: With dimensioning factors exceeding 135 % (DC/AC) simulation with minute values is recommended. These functions can be activated in the "Simulation Parameters" dialog under "System Type, Climate and Grid".

Recovered backup copies are available. (File > Backup Copies > Recovered Files)

Activate Windows
Go to Settings to activate Windows.



PV Modules

- Module Area 1
 - Shading
 - Degradation of Module
- Module Area 2
 - Shading
 - Degradation of Module

Company
US Electronics☒ Selection☐ Photo Plot☒ Graphic C...☒ Full

Additional Parameters

Number of PV

Orientation of

Inclination of

Installation Type

Roof View - [Module Area 2]

Coordinates (8,942; 2,180) m - No Distances Possible -

Current Roof
Roof
Restricted Area
Restricted Area1
Restricted Area2
PV Areas
PV Areas

Y-Axis [m]
6
5
4
3
2
1
0

Ridge

Gable End, West

Gable End, East

Eaves

X-Axis [m]
0 1 2 3 4 5 6 7 8 9 10

Enter Coordinates [m] in [m]:

Point	X	Y
1	0,000	0,000
2	0,000	0,000
3	0,000	5,300
4	10,000	5,300

Position of PV Area:

x = 0 m
y = 0 m

Position of PV Modules:

x = 3,612 m
y = 0,267 m

Installation Type:

Roof parallel

Module Orientation α 270 °

Module Inclination β 40 °

These values adapt to the roof angle!

You are planning a roof parallel system! (Module Number: 25 | PV Generator Output: 7,50 kWp)

— No Error —

Help OK Cancel



Project Data

Project Name System planning 20
Project Number 12345
Project Designer TSS
Start of Operation 31.01.2019

System Type, Climate and Grid

Type of System Grid-connected PV syst...
Climate Data Delft, NL0
Resolution of the... 1 h
AC Mains 230 V, 3-phase, 50 Hz
Maximum Feed-in...

Consumption

Total Consumption 4500 kWh
Load Peak 3,2 kW
Resolution of the... 15 min

PV Modules

Module Area 1
Module Data LC300P18-G4
Manufacturer US Electronics Inc.
Number of PV Mo... 25
PV Generator Ou... 7,5 kWp
Inclination 40°
Orientation 270°
Installation Type Roof parallel

Inverters

Module Area 1
1x Inverter 1 Sunny Tripower 7000TL...
Manufacturer SMA Solar Technology AG
Configuration HWP 1: 1 x 12
HWP 2: 1 x 12

Electric vehicles

Electric vehicle Mercedes-Benz S 250 e
No. of vehicles 1
Charging Power 11 kW
Battery Capacity 28 kWh
Range in accordance... 300 km

Cables

Total Loss 0,18 % (24 h)

Configuration 1, Inverter 1: Maximum inverter power of 2,38 kW exceeded (Currently: 3,7 kW)

Configuration 2: With dimensioning factors exceeding 125 % (DC/AC) simulation with minute values is recommended. These functions can be activated in the "Simulation Parameters" dialog under "System Type, Climate and Grid".

Recovered backup copies are available. (File > Backup Copies > Recovered Files)

Activate Windows
Go to Settings to activate Windows.



Project Data

Project Name	System planning 2D
Project Number	12345
Project Designer	155
Start of Operation	31.01.2019

System Type, Climate and Grid

Type of System	Grid connected PV syst...
Climate Data	DE17, 16.0
Resolution of the...	1 h
AC Mains	230 V, 3 phase, 50 Hz
Maximum Feed-in...	No

Consumption

Total Consumption	4500 kWh
Load Peak	3,2 kW
Resolution of the...	15 min

PV Modules

Module Area 1	
Module Data	LG300H16-G4
Manufacturer	LG Electronics Inc.
Number of PV Mo...	25
PV Generator Ou...	7,5 kWp
Inclination	40°
Orientation	180°
Installation Type	Roof parallel
Module Area 2	

Inverters

Module Area 1 + ...	
1 x Inverter 1	SE15K
Manufacturer	SolarEdge
Configuration	HPF 1: 1 x 3 x 1 x 1

Electric vehicles

Electric vehicle	Mercedes-Benz E 250 e
No. of vehicles	1
Charging Power	3 kW
Battery Capacity	20 kWh
Range (maximal)	300 km

Costs

Total Costs	8.750 €
-------------	---------

Financial Analysis

Activate Windows
Go to Settings to activate Windows.

Inverters

Configure module areas together

Module Area 1 + Module Area 2

Suggest Configuration

Living [Selected]

Select Configuration

CHECK

VALUES

CHANGE

CONFIRMATION: Module Area 1 + Module Area 2

INVERTER 1: Including Configuration

1 x SolarEdge

SE15K

Power Optimizer

SolarEdge

HPF 1: 1 String x 3 Optimizer

P7000-40AC

1 Parallel module x 1

Modules in series

Module Area 1

Add Row

Module Areas:

Module Area 1: 25 x LG300H16-G4 = 7,5 kWp

Module Area 2: 25 x LG300H16-G4 = 7,5 kWp

Options:

Check System

Configuration Limits

☐ Choose inverters only from Catalogue

Specified number of modules on Module Area 1 + Module Area 2: 50 (Number of configured modules: 5)

Inverter 1, HPF 1: Minimum no. of power optimizers per string of 36 not reached (Currently: 9)

Inverter 1: Minimum inverter output of 13,5 kW not reached (Currently: 3,7 kW)

Recovered backup copies are available. (File > Backup Copies > Recovered Files)

4

4