

Sample calculation with SUNNY DESIGN

www.sunnydesignweb.com



SMA Solar Technology AG • Sonnenallee 1 • 34266 Niestetal

Project name: Sunny Boy 2.5 kW
-Self-consumption

Project number: ---

Grid voltage: 230V (230V / 400V)

System overview

12 x .SMA SMA Demo Poly 240 (PV array 1)
Azimuth angle: 0 °, Tilt angle: 30 °, Mounting type: Roof, Peak power: 2,88 kWp



1 x SB 2.5-1VL-40

System Monitoring



Sunny Portal



SMA Energy Meter

Technical data

Total number of PV modules:	12	Performance ratio (approx.):*	86,5 %
Peak power:	2,88 kWp	Spec. energy yield (approx.):*	986 kWh/kWp
Number of inverters:	1	Line losses (in % of PV energy):	---
Nominal AC power:	2,50 kW	Unbalanced load:	2,50 kVA
AC active power:	2,50 kW	Self-consumption:	1.332,51 kWh
Active power ratio:	86,8 %	Self-consumption quota:	46,9 %
Annual energy yield (approx.):*	2.838,60 kWh	Self-sufficiency quota (energy consumption in %):	29,6 %
Energy usability factor:	99,8 %		

Version: 3.22.0.R

Signature

*Important: The yield values displayed are estimates. They are determined mathematically. SMA Solar Technology AG accepts no responsibility for the real yield value which can deviate from the yield values displayed here. Reasons for deviations are various external conditions, such as soiling of the PV modules or fluctuations in the efficiency of the PV modules.

Evaluation of design

Project name: Sunny Boy 2.5 kW - Self-Consumption

Project number:

Location: Germany / Kassel

Ambient temperature:


Annual extreme low temperature: -13 °C

Average high Temperature: 19 °C

Annual extreme high temperature: 33 °C

Subproject 1

1 x SB 2.5-1VL-40

Peak power:	2,88 kWp
Total number of PV modules:	12
Number of inverters:	1
Max. DC power (cos φ = 1):	2,65 kW
Max. AC active power (cos φ = 1):	2,50 kW
Grid voltage:	230V (230V / 400V)
Nominal power ratio:	92 % 
Displacement power factor cos φ:	1






SB 2.5-1VL-40

Technical data

Input A: PV array 1

12 x .SMA SMA Demo Poly 240, Azimuth angle: 0 °, Tilt angle: 30 °, Mounting type: Roof

	Input A:		
Number of strings:	1		
PV modules per string:	12		
Peak power (input):	2,88 kWp		
Typical PV voltage:	 330 V		
Min. PV voltage:	303 V		
Min. DC voltage (Grid voltage 230 V):	50 V		
Max. PV voltage:	 495 V		
Max. DC voltage:	600 V		
Max. current of PV array:	 8,1 A		
Max. DC current:	10 A		

PV/Inverter compatible




Version: 3.22.0.R

System Monitoring

Project name: Sunny Boy 2.5 kW - Self-Consumption

Location: Germany / Kassel

Project number:

PV system	System Monitoring	
Subproject 1  1 x SB 2.5-1VL-40	Within the PV system  SMA Energy Meter Universal acquisition of measured values for intelligent energy management	External  Sunny Portal Internet portal for monitoring PV systems and for the visualization and presentation of PV system data

Self-consumption

Project name: Sunny Boy 2.5 kW - Self-Consumption

Location: Germany / Kassel

Project number:

Information on self-consumption

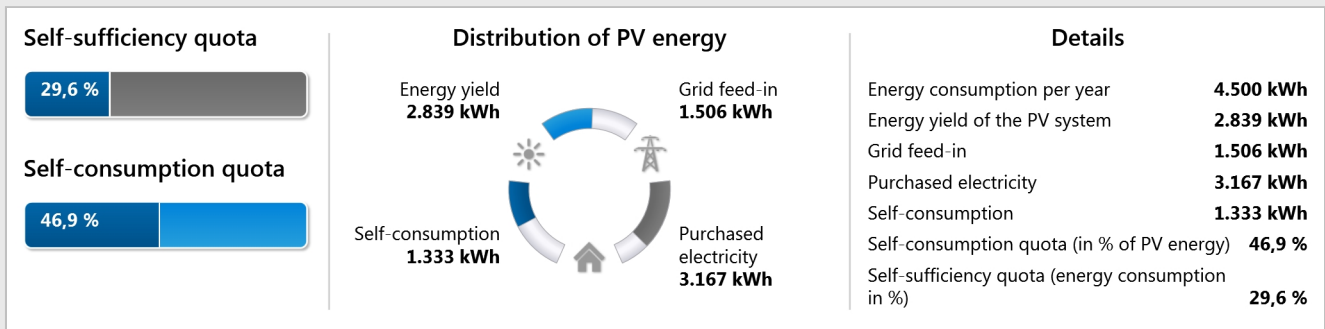
Load profile: 4-person household

Energy consumption per year: 4500 kWh

Increased self-consumption

Result

Without increased self-consumption



The displayed results are estimated values which are derived mathematically. SMA Solar Technology AG accepts no liability for the actual self-consumption which may deviate from the values displayed here. The potential self-consumption essentially depends on individual load patterns, which may deviate from the load profile on which the calculation is based.

Version: 3.22.0.R

Efficiency analysis

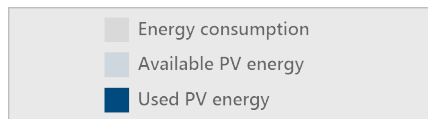
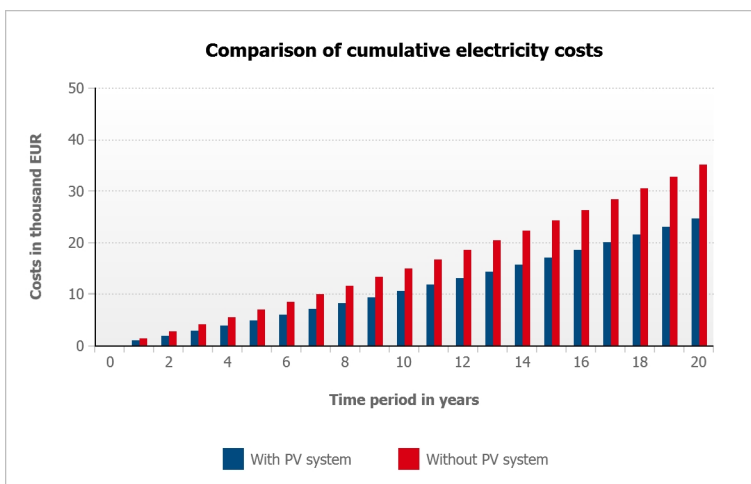
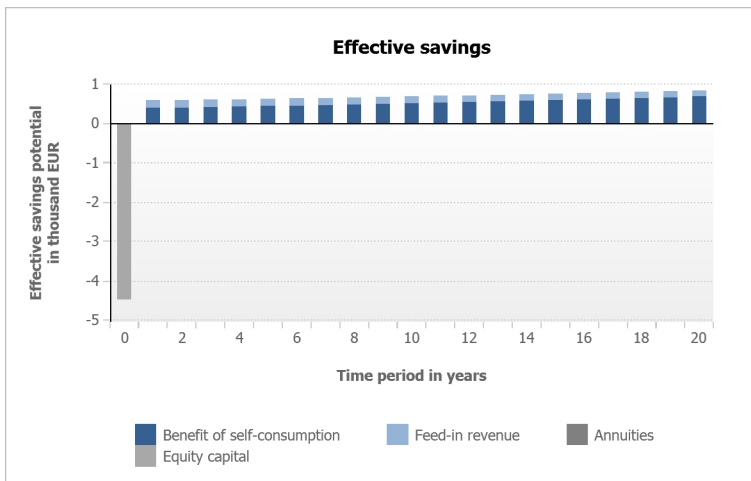
Project name: Sunny Boy 2.5 kW - Self-Consumption

Location: Germany / Kassel

Project number:

Details	
Electricity cost savings in the first year (approx.)	373 EUR
Total electricity cost savings after 20 year(s) (approx.)	7.767 EUR
Total revenue from grid feed-in after 20 year(s) (approx.)	3.513 EUR
Expected amortization period in years (approx.)	9
The total investment is	4.460,00 EUR
The specific capital expenditure costs are	1.548,61 EUR

Comparison of annual electricity costs	
Today without PV system	1.260 EUR
In 20 year(s) without PV system	2.276 EUR
Today with PV system	887 EUR



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Efficiency analysis

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Cost structure

PV system costs

The total costs for the PV modules are **1.920,00 EUR**

The average power degradation of the PV modules is **0,50 %**

The total costs for the inverters and PV system monitoring (incl. SMA Energy Meter) are **1.040,00 EUR**

The costs for planning and installation are **1.500,00 EUR**

The annual fixed costs are **60,00 EUR**

The total investment is **4.460,00 EUR**

The specific capital expenditure costs are **1.548,61 EUR**

Financing

The currency is **EUR**

The equity ratio is **100 %**

The debt ratio is **0 %**

The grant amount is **0,00 EUR**

The inflation rate is **3,00 %**

The analysis period of efficiency is **20 Years**

Selected type of credit: **Annuity loan**

The credit period is **10 Years**

The redemption-free period is **0 Years**

The interest rate is **4,0 %**

Electricity purchase costs and feed-in tariff

The electricity purchase price is **0,280 EUR/kWh**

Special tariffs are not taken into account

The annual rate of electricity price increase is **3,0 %**

The feed-in tariff is **0,129 EUR/kWh**

The duration of the feed-in tariff is **20 Years**

The feed-in revenue on expiration of the remuneration period is **0,050 EUR/kWh**

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