/ Project documentation

h30_ne_tidesolar_18

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Project number: ---
Location: Germany / Lörrach
Date: 3/27/2023

Created with Sunny Design 5.41.1

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Location: Germany / Lörrach
Grid voltage: 230V (230V / 400V)

System overview

18 x Tidesolar Technology Co. Ltd. TD-410MC-108HC (08/2022) (PV array 1)
Azimuth angle: -57 °, Tilt angle: 45 °, Mounting type: Roof, Peak power: 7.38 kWp

1 x SMA STP8.0-3AV-40

Battery system

3 x SMA Sunny Island 8.0H — 3 x Lead (20 kWh)

PV design data

Total number of PV modules:	**18**	Line losses (in % of PV energy):	**---**
Peak power:	**7.38 kWp**	Unbalanced load:	**0.00 VA**
Number of PV inverters:	**1**	Annual energy consumption:	**4,400 kWh**
Nominal AC power of the PV inverters:	**8.00 kW**	Self-consumption:	**4,139 kWh**
AC active power:	**7.60 kW**	Self-consumption quota:	**57 %**
Active power ratio:	**103 %**	Self-sufficiency quota:	**77.1 %**
Annual energy yield*:	**7,264 kWh**	Total nominal capacity:	**20.00 kWh**
Energy usability factor:	**100 %**	Annual nominal energy throughputs of the battery:	**112**
Performance ratio*:	**87.1 %**	CO_2 reduction after 20 years:	**49 t**
Spec. energy yield*:	**984 kWh/kWp**		

*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.

Your energy system at a glance

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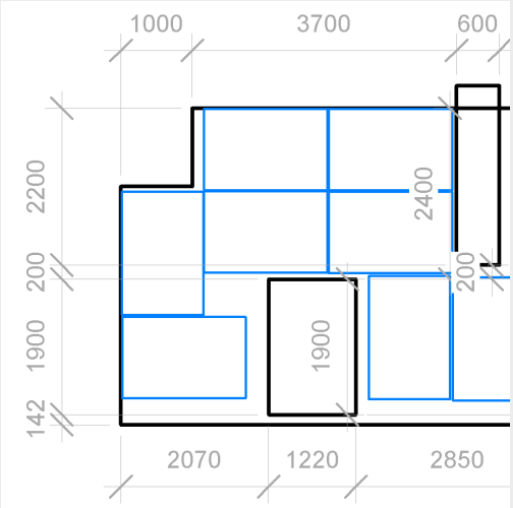
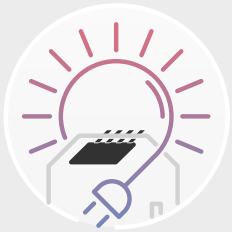


Energy system

PV system	**PV inverter** 1 x SMA STP8.0-3AV-40	**PV arrays** 18 x Tidesolar Technology Co. Ltd. TD-410MC-108HC
Battery system	**Battery inverter** 3 x SMA Sunny Island 8.0H	**Battery** 3 x Lead (20 kWh)
Additional components	**Energy management** 1 x Sunny Portal	
System size	**PV system** 7.38 kWp	**Battery system** 20.00 kWh

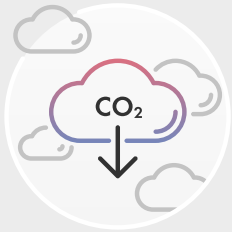
Benefits

313 EUR
Feed-in tariff in the first year



77.1 %
Self-sufficiency quota

79 EUR
Electricity costs saved per month



49 t
CO_2 reduction after 20 years

Total savings after 20 year(s): 17,239 EUR

Inverter designs

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Ambient temperature:
Annual extreme low temperature: -10 °C
Average high Temperature: 20 °C
Annual extreme high temperature: 33 °C

/ Subproject Subproject 1

1 x SMA STP8.0-3AV-40 (PV system section 1)

Peak power:	7.38 kWp
Total number of PV modules:	18
Number of PV inverters:	1
Max. DC power (cos φ = 1):	8.16 kW
Max. AC active power (cos φ = -0.95):	7.60 kW
Grid voltage:	230V (230V / 400V)
Nominal power ratio:	105 %
Dimensioning factor:	97.1 %
Displacement power factor cos φ:	-0.95
Full load hours:	908.0 h

PV design data

Input A || B: PV array 1
18 x Tidesolar Technology Co. Ltd. TD-410MC-108HC (08/2022), Azimuth angle: -57 °, Tilt angle: 45 °, Mounting type: Roof

	Input A || B:
Number of strings:	1
PV modules:	18
Peak power (input):	7.38 kWp
Inverter min. DC voltage (Grid voltage 230 V):	125 V
PV typical voltage:	✓ 527 V
Min. PV voltage:	492 V
Max. DC voltage (Inverter):	1000 V
Max. PV voltage	✓ 739 V
Inverter max. operating input current per MPPT:	32 A
Max. MPP current of PV array:	✓ 13.2 A
Inverter max. input short-circuit current per MPPT:	48 A
PV max. circuit current	✓ 13.9 A

PV/Inverter compatible
You get this inverter including SMA ShadeFix. SMA ShadeFix is a patented inverter software that automatically optimizes the yield of PV systems in any situation. Even under shading conditions.

Information

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PV systems with an installed power of a maximum 25 kWp must, according to the Renewable Energy Sources Act (EEG) 2021, be equipped with technical equipment with which the grid operator can remotely reduce the feed-in capacity in the event of grid overload at all times. Alternatively, the maximum active power feed-in of the PV system at the point of interconnection can be limited to 70% of the installed power.

PV systems with an installed power of more than 7 kWp must, according to the Renewable Energy Sources Act (EEG) 2021, be fitted with technical equipment (iMSys, Smart Meter) with which the grid operator call up the respective actual feed-in.

In Germany, energy generation plants with a power of between 3.68 kVA and 13.8 kVA must be able to make reactive power available in accordance with requirements of the grid operator as of January 1, 2012. The displacement power factor of the inverters used will automatically be adjusted to 0.95 under-excited (-).

Subproject 1

1 x SMA STP8.0-3AV-40 (PV system section 1)

You get this inverter including SMA ShadeFix. SMA ShadeFix is a patented inverter software that automatically optimizes the yield of PV systems in any situation. Even under shading conditions.

Self-consumption (electricity)

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Result

Information on self-consumption

Load profile: **2 adults (1 in full-time employment), 2 children**
Private household of one family. One parent is in full-time employment, the second not. There are two adolescent children.

Annual energy consumption: **4,400 kWh**

Increased self-consumption

3 x SMA Sunny Island 8.0H
For increased self-consumption and to ensure the electricity supply for farming or commercial enterprises. Backup power: 18.0 kW, nominal battery voltage: 48 V

Batteries: **Lead**

Capacity: **20.00 kWh** Of which can be utilized: **50 %**

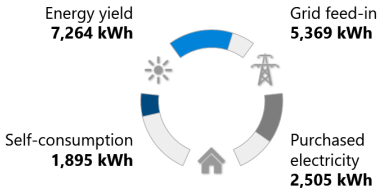
To implement increased self-consumption, you need either an SMA Energy Meter or a Sunny Home Manager. A Sunny Home Manager 2.0 is required for systems with zero feed-in.

Without increased self-consumption

Self-sufficiency quota

Self-consumption quota

Distribution of PV energy



Details

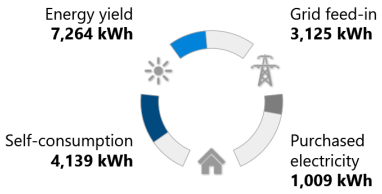
Annual energy consumption	**4,400 kWh**
Annual energy yield	**7,264 kWh**
Grid feed-in	**5,369 kWh**
Purchased electricity	**2,505 kWh**
Max. purchased electricity power	**7.17 kW**
Self-consumption	**1,895 kWh**
Self-consumption quota (in % of PV energy)	**26.1 %**
Self-sufficiency quota (energy consumption in %)	**43.1 %**

With increased self-consumption

Self-sufficiency quota

Self-consumption quota

Distribution of PV energy



Details

Annual energy consumption	**4,400 kWh**
Annual energy yield	**7,264 kWh**
Grid feed-in	**3,125 kWh**
Purchased electricity	**1,009 kWh**
Max. purchased electricity power	**7.17 kW**
Self-consumption	**4,139 kWh**
Self-consumption quota (in % of PV energy)	**57 %**
Self-sufficiency quota (energy consumption in %)	**77.1 %**
Total nominal capacity	**20.00 kWh**
Annual nominal energy throughputs of the battery	**112**

Monthly values

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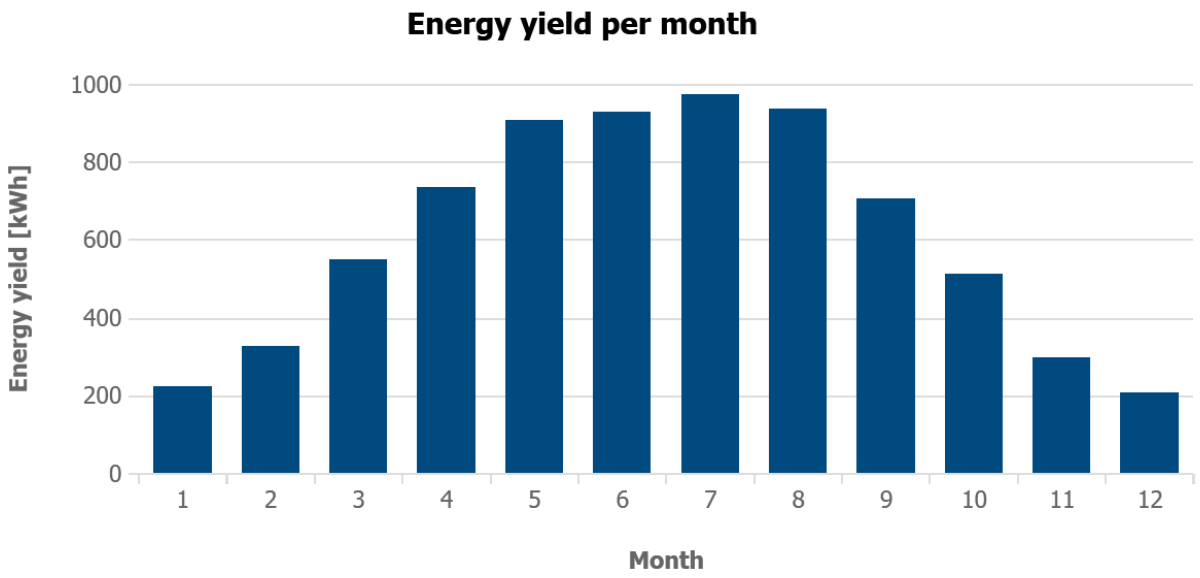
Energy yield



Month	Energy yield [kWh]	Self-consumption [kWh]	Grid feed-in [kWh]	Purchased electricity [kWh]
1	221 (3.0 %)	208	13	223
2	323 (4.4 %)	291	32	131
3	546 (7.5 %)	413	132	54
4	732 (10.1 %)	442	290	11
5	902 (12.4 %)	420	482	17
6	925 (12.7 %)	395	530	7
7	971 (13.4 %)	390	580	23
8	934 (12.9 %)	423	511	0
9	701 (9.7 %)	343	359	19
10	510 (7.0 %)	369	140	98
11	295 (4.1 %)	248	47	188
12	205 (2.8 %)	196	9	238

Project images

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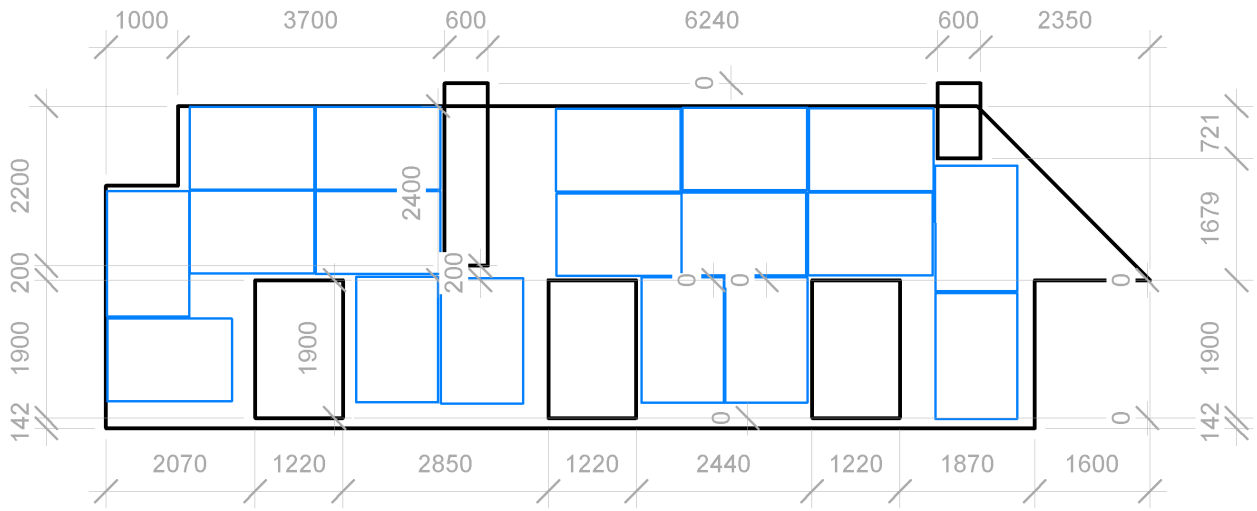

panel placement

roof areas