vdb solar

a member of vdb-concept GmbH

IN COOPERATION WITH THE SUN

Photovoltaic Systems Made in Germany

Photovoltaic Power Systems - Made in Germany

About us

vdb-solar is a branch of vdb-concept GmbH group in Bremen.

It was established in 2006 by members of German enterprises of the machine building industry and completed by experts of electro technology and photovoltaics. Since then, the group continuously has been growing.
vdb-solar is specialized in the construction of turn-key PV-plants for your internal needs as well as for feeding local electric supply networks.

Especially in the industrial range, we are in a position to realize plants up to some mega watt consumption Europe-wide.
With our partners we are able to refer to round about 25 megawatt of installed performance.

The computer-simulation used by us to develop the layout of the constructions and the calculation of profitability is based on latest software applications installed worldwide and approved and accepted by substantially German banks as well as by resident electric utilities.

Our aim is your benefit and reliability:

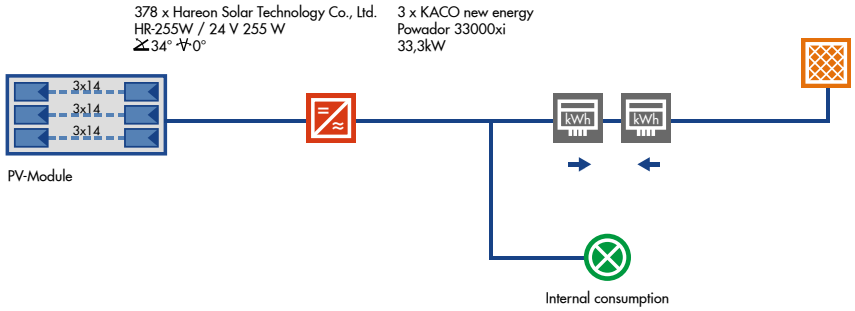
- Expertise/highly qualified Know How,
- consultancy according to your individual needs and professional performance and implementation of your individual projects
- Plant components coordinated in an optimal way as modules and inverted rectifiers according to your requirements
- Proximity to customers, optimal solutions provided, good and reliable order fulfillment
- Turn-key preparation of the overall project according to your individual needs, of course also sub-projects
- Economically priced realization = high profitableness and rate of return

We are sure to find and submit interesting individual solutions for you and are looking forward to talking to you.

Costs / Profit

Due to the contemporary extremely low expense situation during production processes of such PV constructions, the production of a kilo-watt hour about 8-15 ct. is possible. In this calculation included are already current costs (insurance, maintenance, repairs) within a period of 20 years.
Subsequent an example of a construction to be realized in Germany:

Plant Data



Location:	Ulm	
Climate Data Set:	Ulm (1981 - 2000)	
PV-Output:	96,39	kWp
PV-Gross- / Reference Face:	731,95 / 730,47	m^2
PV-Generator Solarisation:	930.244	kWh
PV-Gen. produced energy (alternating current):	98.208	kWh
Net Supply:	52.630,2	kWh
Consumption Demand:	135.000	kWh
PV-Gen. energy directly used:	45.578	kWh
Net Supply:	89.592,8	kWh
Solar Fraction:	72,6	%
System Efficiency Factor:	10,5	%
Performance Ratio (degree of utilization):	79,9	%
Inverted Rectifier Degree of Utilization:	94,8	%
PV-Generator Degree of Utilization:	11,1	%
Spec. annual return:	1.017	kWh/kWp
Avoided CO2-Emissions:	74.510	kg/a

These results were determined by a numerical modeling.
The actual output of the photovoltaic facility may differ due to variation of weather conditions, efficiency of modules and inverted rectifier and other factors.
The above mentioned construction schema does not replace professional technical planning of the photovoltaic construction.

Costs / Profit

Calculation of Profitability

Data of Plant-system

PV-Output: 96,39 kWh

Operation of construction: 01.10.2013 — Total Degradation: 15,00 %

Power Input:

Concept of Input:	Internal Consumption
For the first 20 years:	0,1347 €/kWh
Subsequently:	0,0000 €/kWh

Common Parameter of Efficiency:

Period under Review:	20 years
Interest on capital:	1,50 %

All Details excluding VAT

Balance of costs:

Investments:	154.224,00 €
Internal costs:	462,67 €/a
Remuneration for Feeding first year:	7.090,92 €/a
Economies of purchased electricity:	6.811,08 €/a

Conclusion of present value method:

Capital Value:	82.239,09 €
Payback period:	12,6 Jahre
Return	5,7 %
Presentation of electricity to customs	0,09 €/kWh

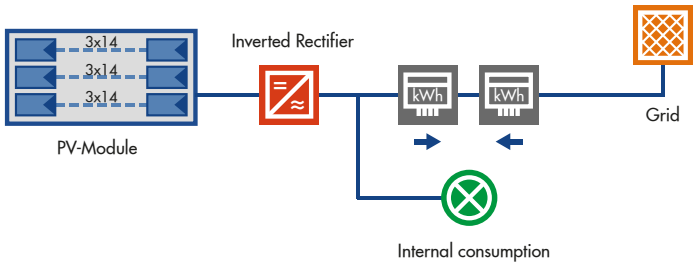
vdb-solar offers you a costs – return - comparison, not based on the „best case“ but vdb-solar calculates in a conservative way, e. g. the to be realized return is usually higher than stated in the calculation of profitability.

Please let us show you in a personal counseling interview the advantage of a conservative calculation of profitability.

Technology in detail:

Mode of Operation of a Photovoltaik-Construction

Grid-interconnected Systems



The generator of a photovoltaic-system consists out of a corresponding amount of photovoltaic modules according to the demand to be produced which are producing the necessary energy for feeding the local electric supply networks as well as providing the internal consumption. This energy generated by solar radiation is now converted into a compatible voltage waveform for the grid.

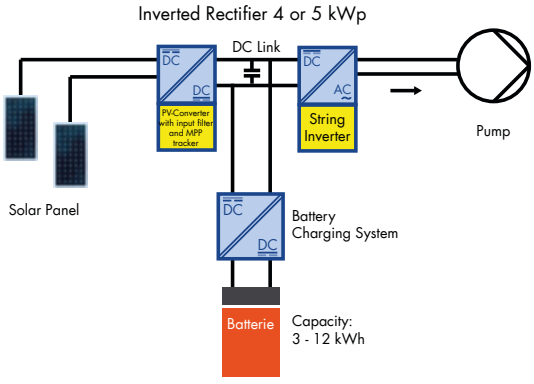
The inverted rectifier „hacks“ the produced direct current into alternating current, synchronizes it with the grid and supplies it resp. provides it for the use of the appliances, the so called “internal consumption”.

Autarkic Systems / Island Systems

We are actively working also in this field cooperating with our partners who are specialized in the storage of electric energy. For example for accommodation units aside from the electric distribution networks, irrigation systems in the field of large area utilization.

Our partners are doing research and development work in this segment to continuously reduce costs and to economize the storage of electric energy.
Already now we are in a position to realize such systems, custom-made for your application and to convenient conditions for you.

System Configuration for Pumps



Imagesources

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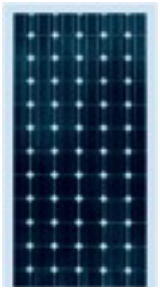
Photovoltaic-Modules



Mono-crystalline *PV-Modules belong to solar modules which are quite complex to be produced. Due to the high silicon content of the photovoltaic cells, these modules are very effective having an impact on the degree of efficiency and consequently produce a higher solar harvest. On this account mono-crystalline solar modules are very suitable for roof areas that only offer little space to install a PV-construction.* PV-Modules have a durability of approximately 30 years. The typical recognition feature of mono-crystalline PV-Modules is the dark-blue/blackish coloring. In comparison to poly-crystalline PV-modules, mono-crystalline PV-Modules do have a higher degree of efficiency, however, they are mostly costlier and widely spread.

The recognition feature of **poly-crystalline** *PV-Modules is the bluish coloring und the crystalline structure.*
Poly-crystalline PV-Modules have a smaller degree of efficiency than for example mono-crystalline PV-Modules. This results from the fact that during production less pure resp. more impuresilicon is used. Poly-crystalline PV-Modules also have a durability of approximately 30 years. These PV-Modules are especially suitable for larger roof areas, because in contrast to the majority of mono-crystalline PV-Modules, comparable space given, less output is produced.

Crystalline Thin Layer Solar Modules *consists of a approx. two micro meter thin layer of silicon. This aspect turns this form of solar modules to be very interesting. The crystalline silicon-thin-layer-solar-cells integrated in the solar module, also called „KSD" (CST),* are economically very interesting based on the fact that considerable less silicon is required while producing solar modules. The degree of efficiency of the crystalline thin-layer-modules is considerable located below the mono- and poly-crystalline modules.

Inverted Rectifier – the heart of a Photovoltaic Plant

Mode of Operation

Besides the solar modules, the inverted rectifier – also called „inverter" is an important part of the photo-voltaic plant. Photo-voltaic modules produce direct current. Mostly though, consumers demand alternating current. The inverted rectifier undertakes the task of making the produced current useable.
Good inverted rectifiers make sure by functions like the „maximum power point tracking" that the overall efficiency of the construction is maximized.

Efficiency of the Inverted Rectifier

It depends amongst others on the efficiency oft the inverted rectifier. The lower the efficiency, the more current will be lost during the transformation process.
Excellent efficiency ranges nowadays at 97%.
A calculation shows that already three percent of difference in efficiency concerning the inverted rectifier cause 1200 Euro shortfall in 20 years, given an efficiency of the construction of 8 - 10 kWp. The DC-Actual power output of the inverted rectifier is decisive for the amount of inverted rectifiers needed for a photovoltaic construction. To an inverted rectifier having 4 kW DC-Actual power outputs, it is possible to connect 20 modules with each 200 Watt-Peak Efficiency.

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If you have any further questions, please do not hesitate to ask. We are glad to help you and are looking forward to hearing from you.

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