

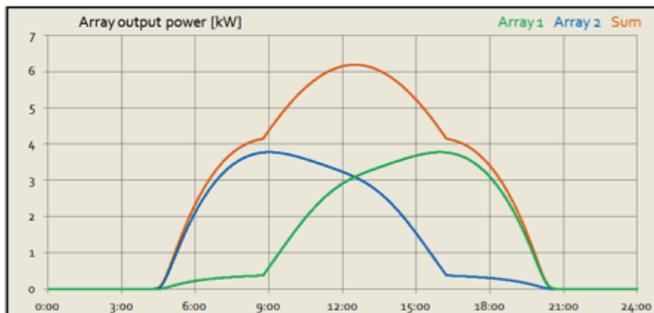


SOLIVIA TL solar inverters – Optimized for your own energy consumption, flexible for all areas of application

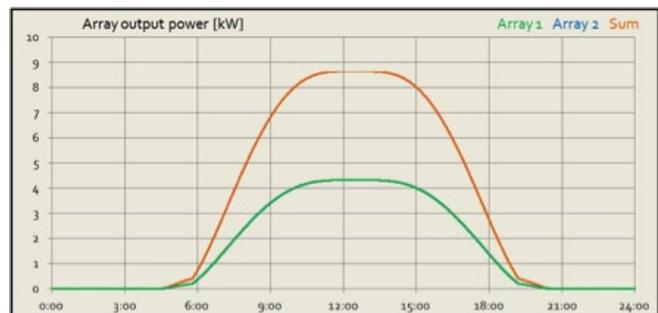
Delta Technical Article

Up to a few years ago, the guaranteed feed-in tariffs for solar power systems were still much higher than the prices being paid for electricity. This made it worthwhile to feed 100 % of the solar power generated into the grid, and then buy back the electricity required for your own use. Now, with grid parity, where the remuneration per fed-in kilowatt hour of solar power is just as high as the cost of a kilowatt hour of grid electricity, and even falls below it, the business model for newly installed solar power systems is changing: Today, system operators are more interested than ever before in obtaining as much of their required electricity from their own solar power systems, thus saving the financial difference between cheaply produced solar power and the more expensively purchased grid electricity.

To cover individual power needs as optimally as possible, east-west roofs are now used when installing PV installations instead of roof areas that are orientated southwards. The advantage of this orientation is that the solar power system produces more energy early in the morning and during the hours of late evening, in this way covering the load profile of a typical household more ideally.



9 kWp distributed on an east-west roof

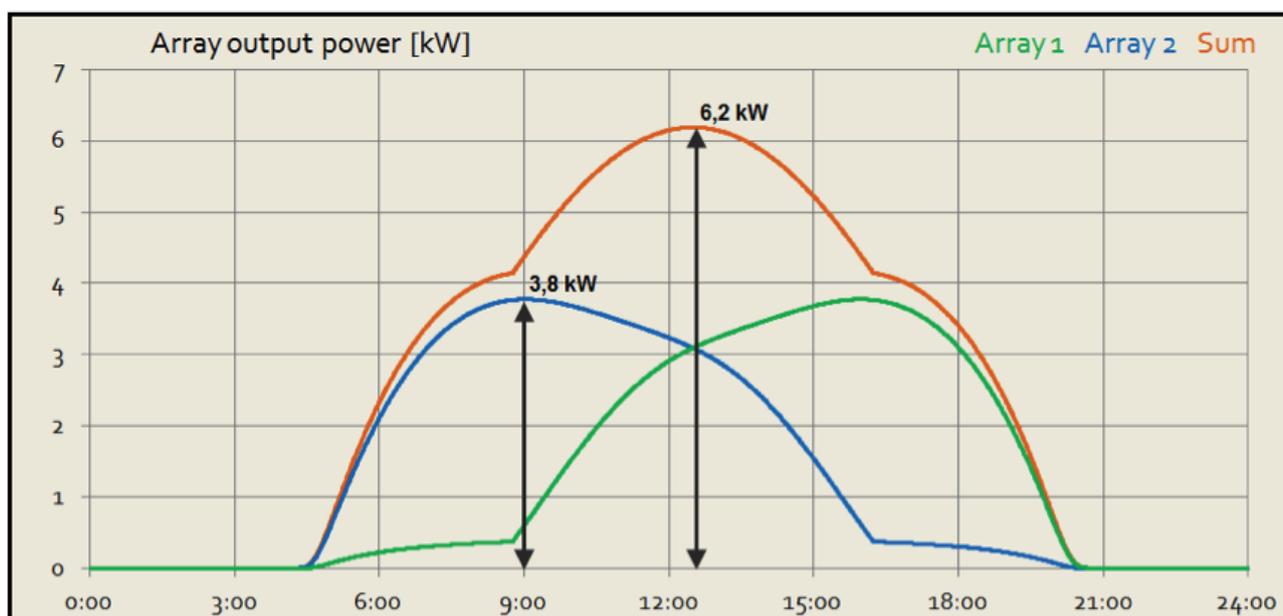


9 kWp with south orientation

The two curves show that with the same PV output, systems with an east-west orientation (left) provide solar power longer than systems with a south orientation (right). The positive side-effect of this orientation for the German market (Renewable Energy Act, EEG2012): If PV systems smaller than 30 kWp have to be limited to 70 % of their DC output (insofar as they are not equipped with telecontrol), this limitation happens automatically depending on the orientation, and the solar energy does not have to be capped.

In contrast to most of the solar inverters with two MPP trackers available on the market, the SOLIVIA TL series inverters have a striking advantage that impacts positively on installation costs: The two MPP trackers of the SOLIVIA TL inverter can each yield 67 % of the inverter's nominal output, which ensures that often a smaller and hence more favorably-priced model can be installed.

The following example compares two installation possibilities of a 9 kWp system with east-west orientation, one with a traditional solar inverter with 2 MPP trackers and one with a SOLIVIA TL inverter:



The diagram shows the output curves of a PV system with 9 kW installed PV output. Half of the solar modules are orientated eastward and the other half are orientated westward. The two solar panels are tilted at an angle of 40° to the horizontal plane. The maximum solar output per solar panel is 3.8 kW, the maximum complete output of the solar modules is 6.2 kW.

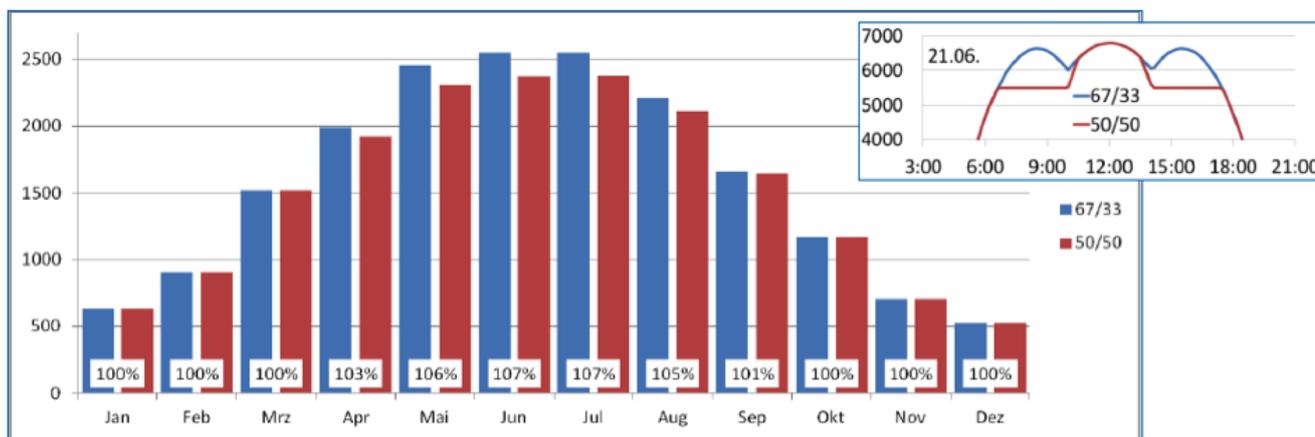
If the PV system has an inverter with two MPP trackers that are each designed for 50 % of the nominal output, then the nominal output of the inverter needs to be at least twice as high as the maximum output of the MPP tracker: In this case, 7.6 kW.

It is different when using an inverter from the SOLIVIA TL series: For the system shown, a SOLIVIA 6.0 TL, for instance, may be used. Its maximum PV output of 6.3 kW suits the maximum output of the solar modules, with each individual MPP tracker designed for 4.02 kW. In this way, it can achieve the maximum yield from both solar panels.

Result: If the same price per watt for the nominal output is assumed for both inverters, then in this example there is an inverter price advantage of 27 % for the SOLIVIA 6.0 TL, compared with an 8 kW inverter from other manufacturers.

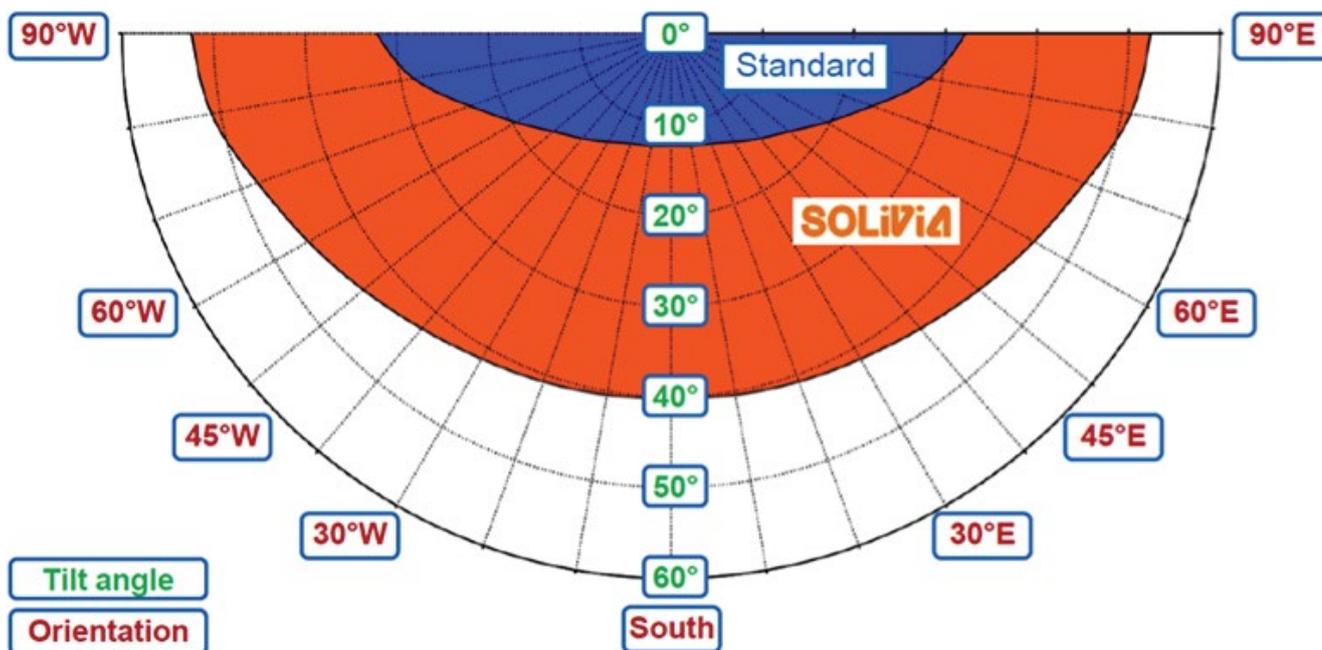
The price advantage in the example can be even more striking for PV systems on roofs with even greater tilt angles. It is also proven that more solar energy can be generated from asymmetrically loaded MPP trackers than from solar inverters where the MPP trackers can only produce 50 %, at most, of the inverter's nominal output.

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The graph shows that the inverters from the SOLIVIA TL series (blue) can produce up to 7 % higher yields especially in the summer months (depending on the orientation of the PV modules). When the annual yield is calculated, a plus of 4 % still remains. This added yield has a positive effect on the returns from the solar power system.

Compared to solar inverters with symmetrically orientated MPP trackers, SOLIVIA TL inverters greatly extend their operation range, and are therefore the best choice for use in “exotic” roof orientations.



About Delta

Smarter. Greener. Together.

Delta Group, founded in 1971, is the global leader in power and thermal management solutions. Our mission statement, "To provide innovative, clean and energy-efficient solutions for a better tomorrow," focuses our role in addressing key environmental issues such as global climate change. As an energy-saving solutions provider, Delta's businesses encompass power electronics, energy management, and smart green life. Delta has sales offices worldwide and manufacturing facilities in Taiwan, China, USA, Europe, Thailand, Japan, India, Mexico, and Brazil.

Since 1999 the subsidiary Delta Energy Systems has invested in the development and global marketing of the Solar Inverter Program, which has made an important and successful contribution to Delta's focus on offering our customers environmentally-friendly power generation for residential and commercial applications. Further, Delta supports installers and users across the whole lifetime of our solar inverter products.

We care deeply about providing fast response times, knowledgeable personnel and overall customer satisfaction. At Delta Energy Systems we believe that more than good products are needed to maximise your energy efficiency.

Delta Energy Systems (Germany) GmbH

Tscheulinstrasse 21
79331 Teningen
Germany
Telephone: +49 7641 455 547
Email: info@solar-inverter.com

www.solar-inverter.com

