

## Maximised self-consumption with innovative solar panel mounting systems

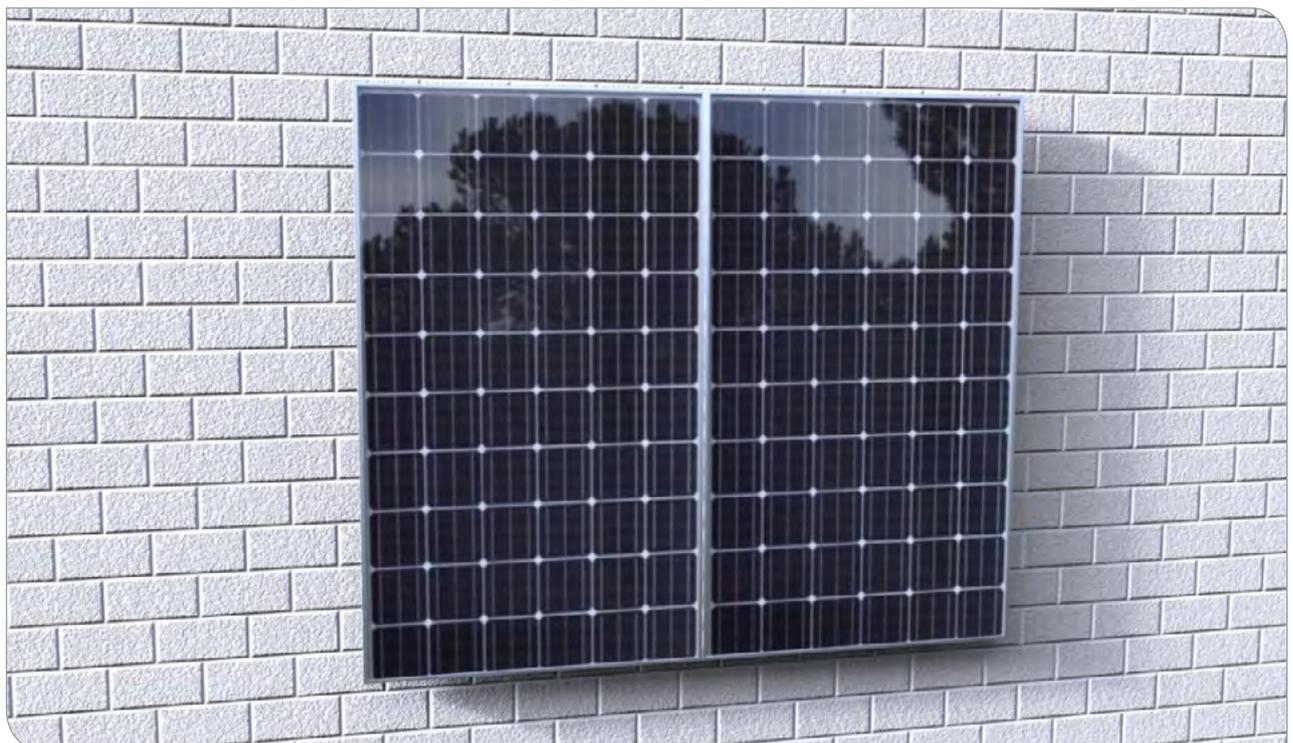
What is the most cost-effective way to install photovoltaic (PV) modules so that the self-consumption of solar energy in households is maximised? The answer to this simple question is more complex than it seems, leading to surprising solutions for home installations on walls and in courtyards and gardens. The reason that these mountings are favourable for self-consumption is not immediately apparent.

In a large-scale experiment with more than 100 photovoltaic arrays installed at different orientation and tilt angles, KIT evaluates the daily energy yield for each configuration throughout the year. The surprising result is that to satisfy the energy demand of an average German household, the orientation is practically irrelevant. In addition to the typical south-facing orientation, both west- and east-facing solar panels can deliver sufficient power. The same applies for the



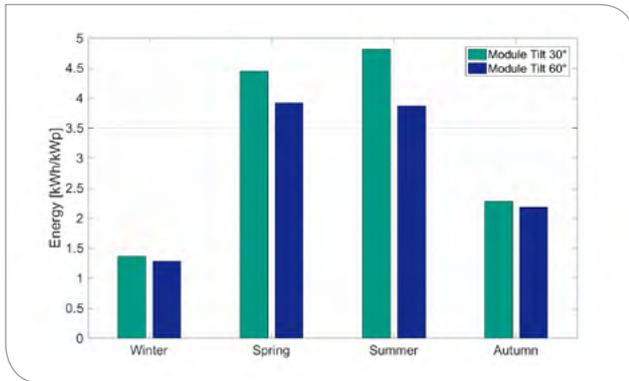
Solar-storage facility on KIT's north campus

inclination angle: arrays with steep angles (i.e.  $60^\circ$  or more) are equally suitable for covering household energy demand as those tilted at the usual  $30^\circ$ . Although the latter are optimised for yearly energy yield, the resulting energy surplus



Hidden wall-mounting system for solar PV modules (Image: build\_up design)

in spring and summer is usually fed into the power grid and not used in the home. Therefore a lower energy yield can be traded for an increased self-consumption ratio.



Average daily energy per season and tilt angle

For this reason KIT has developed mounting solutions for solar installations in a variety of applications. Some of these include vertical panels with hidden wall-mountings, panels that double as rooftops or awnings for bikes, for instance, or panels in courtyards and on lawns. The use of cost-efficient materials and production methods make them competitive on the market. Furthermore they can be produced in high volumes. Licenses for the mounting systems can be purchased from KIT.

The KIT service portfolio comprises customised developments of PV installation systems as well as licensing for the mounting solutions already developed.



KIT's close-to-production mounting solutions (Images: build\_up design)

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