# 340 kWh solar cell energy storage

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How much energy does my (photovoltaic) PV system produce? How much of it ends up in my sonnenBatterie? And, how much of this can I actually use? As a sonnenBatterie owner, you"ve certainly asked yourself these questions. You can find answers at any time in your sonnen App. But how can the differences between the energy produced and the energy available -- conversion losses -- be explained? And what are the standard efficiency values for battery storage systems on the market? We"ll explain all of this in the following article!

When sunlight hits the solar cells of your PV system, electricity flows, and the electrons make their way from your roof to your electricity storage unit. They carry the energy from the sun with them.

However, they have to overcome numerous obstacles on the way. They pass through cables, electrical components (such as inverters), and finally through the batteries of your storage system. At each obstacle or resistance, they release a small amount of their energy - this is when conversion losses occur, similar to the way people lose energy when overcoming obstacles. In an electrical circuit electrical energy is converted into thermal energy. This is why electrical appliances heat up after a while.

Efficiency shows how much electrical energy is converted into heat on the journey from the source to the target. If the efficiency is 80 per cent, 80 per cent of the original electrical energy reaches its destination. In this case, 20 per cent of the electrical energy is referred to as power loss.

The classic light bulb exemplifies how high this power loss can be. An incandescent light bulb can have an efficiency of as low as five per cent. Here, the bulb only converts five per cent of the original electrical energy into light, the rest is converted into heat. LED bulbs, on the other hand, achieve efficiencies of 30 to 40 per cent and are therefore six to eight times more efficient than incandescent bulbs.

From a physical perspective, there can be no such thing as 100 per cent efficiency, as minimal conversion losses always occur. Therefore, the aim of increasing the efficiency of technical devices is to achieve the highest possible efficiency and minimise avoidable losses as much as possible. This is something that we at sonnen achieve with our batteries, which have a high efficiency rate.

Solar panel inverters, for example, which convert the direct current (DC) of solar modules into alternating current (AC) now achieve efficiencies of between 96 and 98 per cent.

High efficiency is a key factor in the development of electrical appliances, though it"s not the only one. Quality, safety, availability in large quantities, and cost are also considered.

For example, the fuel consumption of a car per 100 kilometres is an important parameter, but this alone does

not allow any fundamental statement to be made about the quality of other properties of the car.

A very high level of efficiency can lead to significantly higher costs because the necessary components are extremely expensive or in short supply. Here, a car manufacturer will weigh up which route they want to take, higher efficiency or lower cost.

The same consideration applies to battery storage systems, which also differ in efficiency. A comparison between different manufacturers should be exercised with caution, as the basis for calculating the information in data sheets can vary considerably. In turn, this makes a neutral comparison between different manufacturers difficult.

This is where independent electricity storage inspection comes in, such as those done by ITP"s Battery Test Centre in Australia.

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