

## Jargon buster

When it comes to choosing PV panels there is a huge range in terms of performance and quality but the solar industry doesn't always talk plain English, so we've translated a few buzz words and phrases.

### What does PV mean?

Throughout this document we refer to PV panels/cells. PV is the abbreviation for photovoltaic (comes from the Greek words for 'light' and 'volt'). Photovoltaic panels are referred to as 'solar panels', however this can be misleading as the term 'solar panels' could suggest either a PV or solar thermal panel.

### kWp & kWh

kWp is 'kilowatt peak' e.g. 4kWp. This is the total system size in test conditions but it does not mean you will get 4,000 kWh's from the system. This is because the annual generation is based on orientation, inclination, area & shading. 1 kWh is the same as 1 unit of electricity.



### Cell efficiency

PV cells are one of the components that make up a PV panel and are just one of many factors that can influence the performance of a panel. High cell efficiency is important but is only a starting point. You should keep in mind that good cells can sometimes be fitted inside poor panels.

### Module efficiency

A better indicator of performance than cell efficiency but it is measured under very strict laboratory conditions of brightness and temperature. This would be OK if you lived in a laboratory but since you don't you need to know what happens in real life conditions. See *Real life performance*.



### Size matters

When comparing module efficiency you should never compare panels of different kWp sizes. Larger panels should always appear more efficient because of the way the tests work out. You should always compare panels of the same size to avoid being misled.

### Real life performance

Outside of a laboratory the module efficiency of a panel changes dramatically. Real life conditions can cause different panels to behave in different ways - panel performance always decreases as the temperature increases. This is important as panels need to be in daylight to generate electricity. Some panels don't decrease as much as others.

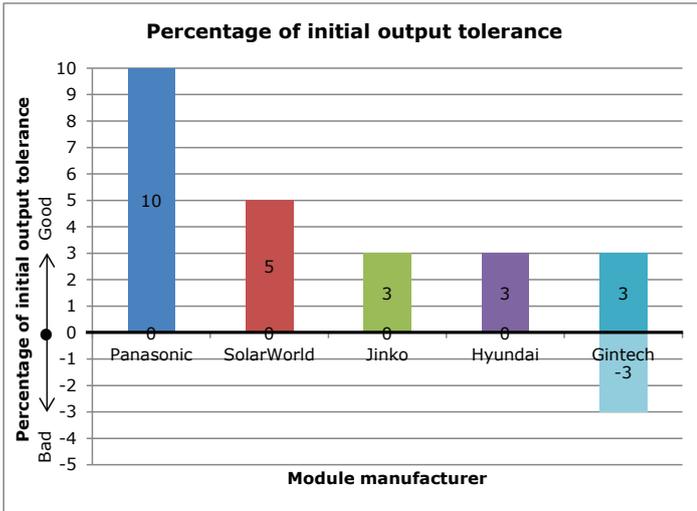


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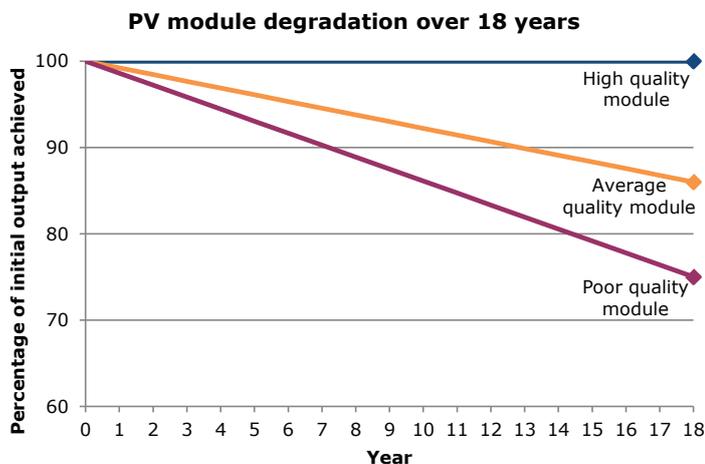
## Output tolerance

There will always be small differences between apparently identical panels due to subtle manufacturing variations. The output rating of a panel is a nominal figure; a panel with an output rating of 240Wp may generate more or less than 240W. Most manufacturers have a +/- output tolerance on their panels. However, some only have a + output tolerance. This is a good thing because it means that the output rating is the minimum the panel will generate. Below is a graph showing this in more detail for some premium panels.



## Degradation

The output of solar panels reduces slowly over the years. Independent studies have shown that this is a result of the original build quality of individual panels and is not a characteristic of all panels. Low quality panels degrade much faster than high quality panels as shown in the graph below.



## Failure rates

PV panels are well known to be very reliable with average failure rates of less than 5% over a 20 year period. It is rare for manufacturers to provide statistics on product reliability with the exception of Panasonic who have been manufacturing their hybrid HIT range since 1990. They have sold over 4 million panels and have an almost imperceptible failure rate of 0.005%. All these failures were visual and not performance related, and all the panels were replaced under warranty.



## Vertical integration

This is a buzz word to describe the quality of a PV manufacturer. The issue is that there are several distinct phases in the manufacture of a solar panel. Some manufacturers such as Panasonic and SolarWorld are big enough to own the whole process from start to finish whereas less established manufacturers buy partly made components from a variety of sources. This makes for a lower cost PV panel but quality may be compromised. A vertically integrated supply chain is what the former companies have.

