ENERGY CONNECTIONS

Good Off Grid Batteries, What's the difference?

Not all Batteries are equal and the following should be taken into account when decided on what batteries to use, they are a big investment and when they fail you will have no power.

Firstly batteries produce different power at different rates of discharge. In general an off grid battery will need to discharge over a relatively short period and then recharge the next day.
So the most appropriate way to determine a batteries capacity is to work on a 10 hour or C_{10} rating. This means the battery has been completely discharged over 10 hours. (Not that you would ever do this).

Second most importantly rating to consider is the cyclic life.
All batteries have a cyclic life at the end of which the battery is spent and can't hold current.
The battery life is directly proportional to the depth of discharge (DOD) and most battery manufacturers will give a graph or values of cyclic life. Cheaper batteries have very poor or low cyclic life.
For example, a battery that has 1500 cycles @ 40 % discharge (which is the maximum we would ever recommend for an off grid system) will only cycle (discharge then charged again) for 1500 times divided by days of the year = 4 years at which time they will need to be replaced.
A good and true deep cycle cyclic battery might have 3000-3500 cycles @ 40% DOD and will last twice as long.

Third most important is weight.
The weight of the individual cells has a great bearing on longevity and the batteries ability to discharge and recharge or cycle.
A battery is basically a chemical storage device and uses chemistry to store electrons or electricity. The most common batteries at this point for off grid are lead based. They use lead and acid and the chemical reaction between to store or release electricity, the more lead and acid inside the battery allows larger amounts of storage and aids the battery in recovering from overcharge and or discharge events. Check the weight of the battery if it weighs 30% less it stands to reason that it has 30% less lead, and it won't last as long.

Fourth is construction.
The best long life true deep storage batteries or cells use a tubular lead construction, that is rather than have flat plates of lead they use tubes of lead. The tube by design is very strong and does not buckle or change shape. One of the biggest battery killers is changes in the internal resistance, this occurs as a battery ages and lead plates change shape, buckle and or get deposits building up between the plates. The build-up essentially causes a low resistance and in extreme cases shorts the plates (battery dead). The greater the distance between lead tubes the larger the build-up needs to be in order to change the resistance, and very little chance of a dead short.

So summing up batteries are not all the same if they appear to be cheap they probably are, check the weight, rated capacity, a c100 battery might be 1600Ah but at c10 battery will only be 1200AH. Check the construction and calculate how long they will last, if a battery is half the cost but lasts less than half the time then is it good value? All batteries are heavy, expensive and hard work to get to site never mind the frustration of losing power. If the battery claims 10 years life do the sums. Will it last for the type of use you are going to give it? Batteries are a big cost but also the most important component of an off grid system.

If this has left you more confused than ever or, need help sizing please contact us.