



# “My batteries are good! I don’t need better balancing!”

We’ve heard that comment more than once. If you feel the same way about your batteries, here are a few questions to consider.

## **How much are you paying for batteries that “don’t need balancing”?**

If you are buying batteries that “don’t need balancing”, you’re paying a premium to get the best of the best: Top tier batteries from a top tier manufacturer, with cells that have been rigorously tested, characterized, sorted and matched to try to minimize out of balance conditions.

## **How much money would you save if you could buy batteries that are not so closely matched?**

True Balancing compensates for mismatches in cell capacities and SOC’s. If you buy batteries with cells that are less closely matched (tier-2 batteries) we estimate that you could save 5% to 10% on the purchase price. And with True Balancing the performance of tier-2 batteries will be nearly identical to tier-1 batteries that use passive balancing.

## **Do your batteries stay balanced for their entire life?**

The short answer is “No” (unless you’re already using True Balancing).

Cell characteristics drift over time. This is inevitable. If cell characteristics didn’t change, then batteries would never die. And cell characteristics do not drift uniformly. Every cell drifts at a different rate. Eventually the cell characteristics will differ so much that passive balancing systems can no longer keep the battery in balance. This can happen to any battery, including top tier batteries. As soon as the battery gets out of balance, it starts losing capacity and starts accelerating towards end of life.

With True Balancing, your batteries will stay balanced for their entire life. True Balancing permanently and completely eliminates loss of capacity due to out of balance cells.

## **Are you getting maximum capacity and full value from your (very expensive) batteries?**

Once again, the short answer is “No” (unless you’re already using True Balancing).

The gold standard for battery charging is to connect each cell in the battery to an isolated CCCV charger and complete a full charge cycle on each cell. This brings each cell up to true 100% SOC without overcharging the cells. This is the ideal way to charge a battery. CCCV charging can store as much energy as possible in every cell without damaging the cells or shortening the life of the battery.

The charging and balancing systems in today's EVs are not able to do this. They cannot bring the battery up to true 100% SOC — even if the battery is brand new and even if the cells are very closely matched. If you're paying a lot of money for the best batteries you can find, your battery management electronics should utilize the full capacity of your batteries.

True Balancing provides the exact equivalent of a CCCV charge cycle to every cell in the battery. And it does this in a compact, low-cost, highly efficient package.

If you switch to True Balancing, you will get the full value out of your batteries. When the batteries are new, the added capacity will typically be 3% to 5% – and even that is a meaningful increase. As the battery ages, the additional capacity that True Balancing provides grows steadily, to 10% or 20% or more depending on the quality of the battery and the use environment.

### **Are you sure you don't need better balancing?**

Even if you have the absolute best batteries in the world, True Balancing will improve their performance. The benefits listed above are just the tip of the iceberg. True Balancing will unlock performance and functionality in your batteries that you might not have dreamed of prior to this.

You're paying a lot of money for your batteries. Maybe it's worth finding out how True Balancing can extract **all** of the power and value in your batteries.