



Choosing the Right Battery: Lithium Ion vs Lead Acid

Both lead acid batteries and lithium ion batteries can be used for Clear Blue Smart Off-Grid power systems. Here are some considerations to help you choose which battery type is better suited for a particular installation.

Expected Battery Life

Regular Life Lead Acid	3-6 Years depending upon system configuration and environment.
Long Life Lead Acid	5-8 Years depending upon system configuration and environment.
Lithium Iron Phosphate (LiFePo4)	6-9 Years depending upon system configuration and environment.

Lithium Ion Batteries Considerations

- Ideal for moderate or hot climates. (Note: they can only be used in locations where the temperature is above freezing)
- Smaller in size and lighter than lead acid batteries.
- Faster charge rate can sometimes reduce the number of required solar panels.
- Approximately equal to long life batteries at a lower cost.
- Lithium has a longer life for higher temperature environments.
- Reliability is heavily dependent on battery management and Smart Off-Grid. Smart Off-Grid will manage charging cycles, state of charge, and other aspects that are key to maximizing performance. In addition, it enables systems to grow and scale in a modular fashion due to Clear Blue's unique Smart Off-Grid energy storage management capabilities.
- Clear Blue recommends Lithium Iron Phosphate, LiFePO₄, which is a safer lithium chemistry.
- Modularity and expansion is more complicated but can be done with Smart Off-Grid.
- Considered a hazardous good for shipping purposes.
- Disposal at end of life can be more difficult and/or more costly.

Lead Acid Batteries Considerations

- Can be used in locations where temperatures drop below freezing,
- Can be transported more easily - not a hazardous good.
- Timelines for manufacturing are faster - and Clear Blue usually has in inventory.
- More established disposal processes means it can sometimes be more environmentally-friendly.
- Lower cost, regular life batteries reduce up front capital.
- Easier to use in parallel for capacity growth and modular capability.