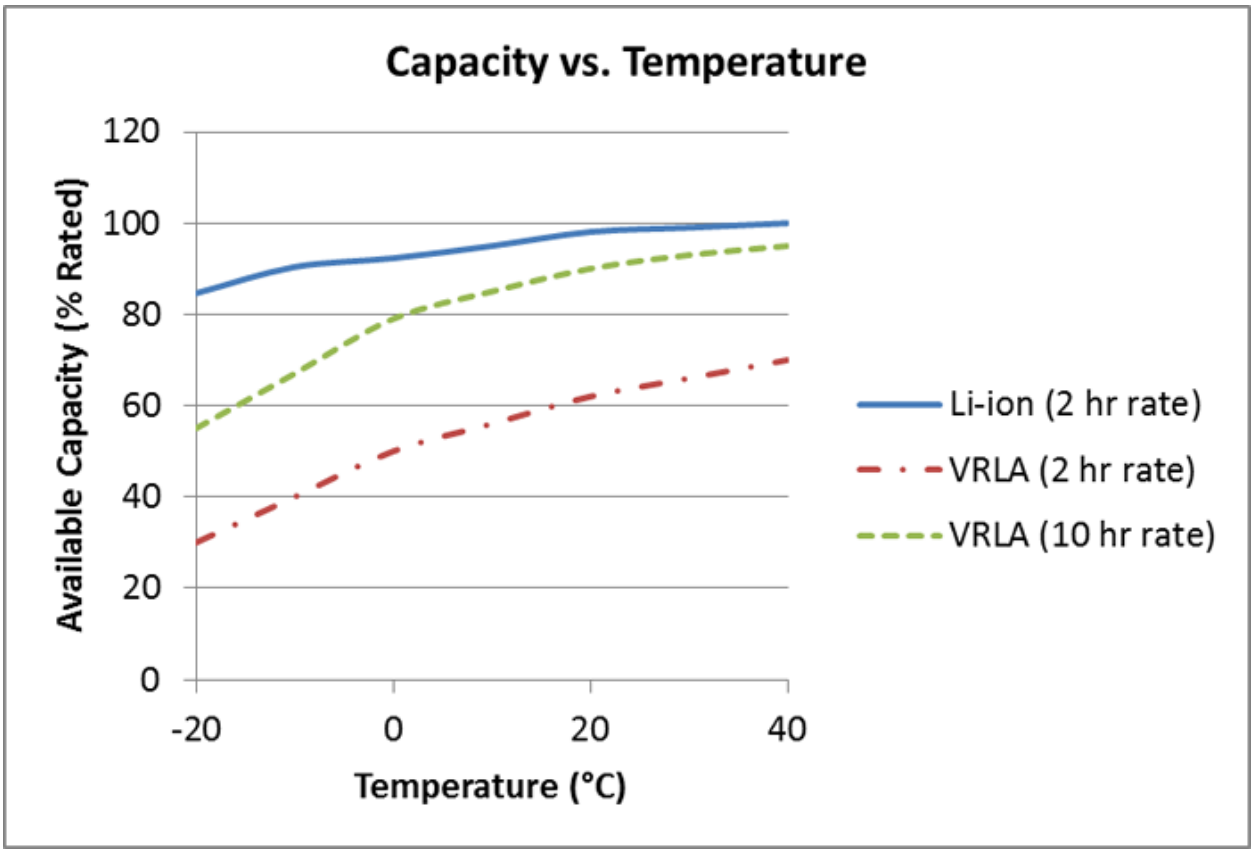
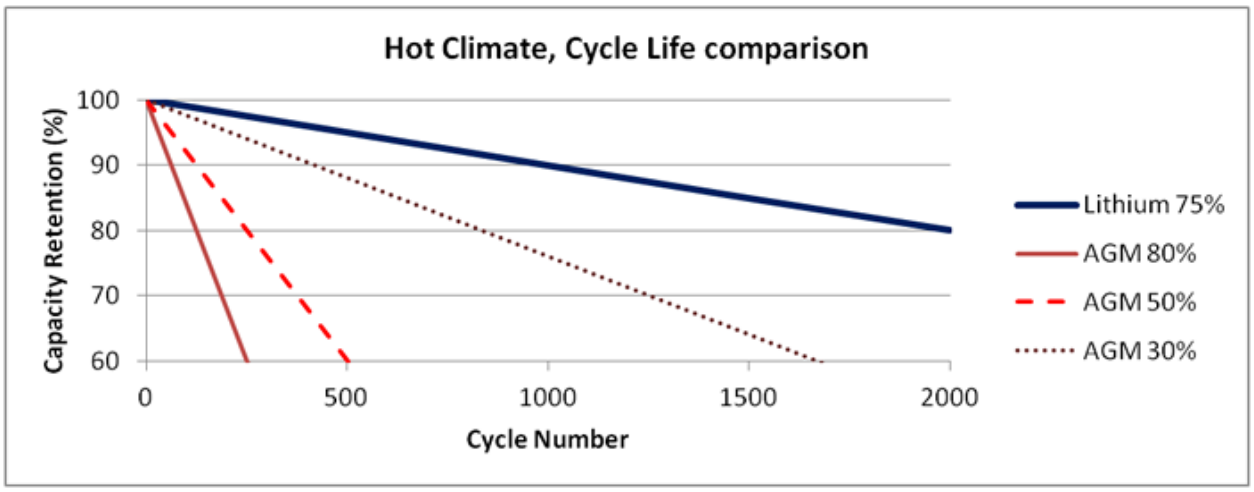
Why is a Li-polymer battery superior to a lead-acid battery?

- **Weight:** Lithium-ion batteries are one-third the weight of lead acid batteries.
- **Efficiency:** Lithium-ion batteries are nearly 100% efficient in both charge and discharge, allowing for the same amp hours both in and out. A lead acid battery's inefficiency leads to a loss of 15 amps while charging and rapid discharging drops voltage quickly and reduces the battery's capacity.
- **Discharge:** Lithium-ion batteries are discharged 100% versus less than 80% for lead acid. Most lead acid batteries do not recommend more than 50% depth of discharge.
- **Cycle Life: Rechargeable lithium-ion batteries cycle 5000 times or more** compared to just 400-500 cycles in lead acid. Cycle life is greatly affected by higher levels of discharge in lead acid, versus only slightly affected in lithium-ion batteries.
- **Voltage:** Lithium-ion batteries maintain their voltage throughout the entire discharge cycle. This allows for greater and longer-lasting efficiency of electrical components. Lead acid voltage drops consistently throughout the discharge cycle.
- **Cost:** Despite the higher upfront cost of lithium-ion batteries, the true cost of ownership is far less than lead acid when considering life span and performance.
- **Environmental Impact:** Lithium-ion batteries are a much cleaner technology and are safer for the environment.
- **Better Performance at Temperature Extremes:** Lead acid batteries and lithium lose their capacity in cold environments. As you can see in the diagram below, Lithium-ion batteries are much more efficient at low temperatures. Moreover, the discharge rate affects the performance of lead acid batteries. At -20°C, a Lithium battery that delivers a 1C current (one times its capacity), can deliver more than 80% of its energy when the AGM battery will deliver 30% of its capacity. For harsh environments (hot and cold), Lithium-Ion is the technological choice.



- In hot climates where the average temperature is 33°C (91.4°F), the disparity between lithium-ion and lead acid is further exacerbated. The cycle life for lead acid (flooded and VRLA) drops to 50% of its moderate climate rating while lithium-ion will remain stable until temperatures routinely exceed 49°C (120°F).



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