



SmartEnergi Power Assurance Service (SPAS™)

Competitive Advantage: SPAS vs Other Behind-The-Meter (BTM) Energy Storage Service Providers

SmartEnergi Power Assurance Service (SPAS™), which is offered with our intelligent battery energy storage system (iBESS™), and equipped with microgrid switching technology, offer significant technology advantage over competing companies offering behind-the-meter energy storage solutions. The table below details some of these advantages.

	Conventional Behind The Meter (BTM) Energy Storage Companies	SmartEnergi Power Assurance Service (SPAS™)
<i>Technology Advantage</i>		
Type of Technology	Mostly Li-ion.	Li-ion or flow battery depending on the load and whether SmartEnergi is supporting short or long-term power interruptions.
Type of Li-ion Technology	Commodity liquid electrolyte Li-ion technology.	Proprietary and safer solid-state Li-ion cell technology.
Performance in High-Temperature Conditions	Tends to degrade significantly when operated in elevated temperatures (especially at temperatures above 45 °C), thereby compromising the ability to deliver the energy they were designed for.	Excellent performance in climates with elevated temperatures. SmartEnergi has successfully cycled our cells at 70 °C (or 158 °F), more than enough to support superior operation of the iBESS in the hottest state in the US.
Performance in Low-Temperature Conditions	Not reliable at temperatures below 0 °C, which could be problematic for deployments in the cold regions of the US.	Excellent performance under low temperature conditions. For instance, our cells retain 74% of the capacity at -20 °C. at the cell level. Packaging can extend the temperature range
Large-Scale (Lithium-ion) Energy Storage Systems	<p>Due to the relatively low thermal stability of conventional lithium ion cells and poor performance under elevated temperature conditions, designers are forced to address excessive cooling requirements in a way that compromises other desirable attributes.</p> <p>For instance, large scale energy storage systems are designed to maintain very strict temperature range of around 35 °C, which increases the cooling requirements. The increase cooling requirements means designers must decide whether the electricity needed for cooling would come from the grid, the energy storage system itself or a combination of both. Either way, the increase cooling requirements increases the operating cost of the storage system, and may reduce the useful energy available for the load. What this means is that the unit cost of the available useful energy is higher than it could be because of the higher cooling overhead.</p>	The superior thermal stability of SmartEnergi's innovative cell allows us to offer superior energy storage performance in hot climates, while reducing the cooling requirements and the overall operating cost.
Cycle Life, Capacity Retention, and Life Cycle Costs	Relatively shorter cycle life and low capacity retention. For instance, conventional LFP cells used in most energy storage systems achieve 1000 cycle life when cycled at 0.5C/0.5C charge/discharge rate at 100% depth of discharge (DOD). Need to reduce DOD to 80% (<i>which reduces available energy</i>) in order to achieve about 2200 cycles. The relatively short cycle life translates into higher life cycle costs.	Superior capacity retention and over 2 times cycle life advantage. Achieves over 2,000 cycle life when cycled at 0.5C/0.5C charge/discharge rate at 100% DOD. Maintains 86% capacity retention at cycle number 2,000 at 100% DOD). More significant, by offering over 2 times cycle life advantage of our cells, we can significantly lower life cycle costs of the energy storage system.