

## Battery System Design with Thermal Management

CellSage	Other Predictive Modeling tools	Electrochemical Impedance Spectroscopy (EIS)	Load Testing
<p>CellSage can be used to explore and optimize thermal management schemes for battery packs, balancing battery life requirements (via warranty) with reality of use conditions in the field such as annual temperature cycle at location. Economical, streamlined packs are the targets that are neither overdesigned nor under-designed.</p>	<p>Empirical techniques would only provide a rough approach, resulting in poorly optimized thermal management for battery packs.</p>	<p>Not directly amenable to thermal management.</p>	<p>Amenable to thermal management, but at multiplied cost to gain data over a range of temperatures.</p>

**Competitive Advantage:** CellSage enables a scientific approach to the complex issue of designing thermal management of battery packs that considers battery aging effects over multiple years of arbitrary use. The effects of temperature-at-location and daily thermal cycling of battery pack are covered by the modeling approach.