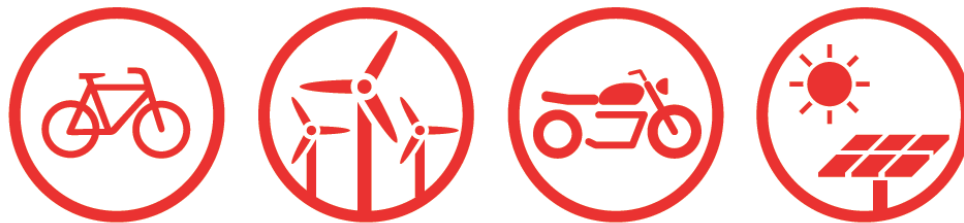


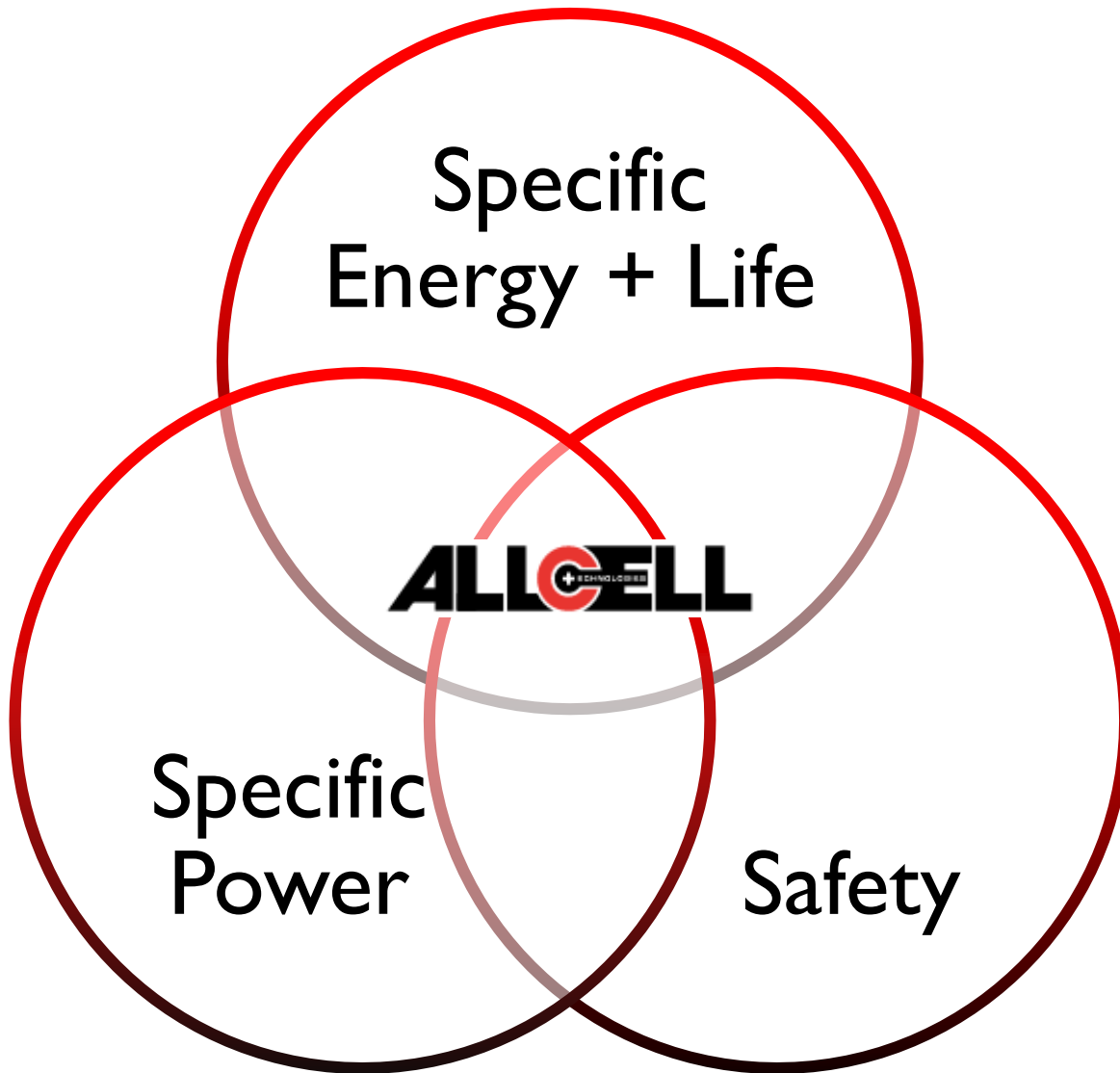
AllCell Technologies, LLC

Cool by Design™

PCC Extends Battery Cycle Life

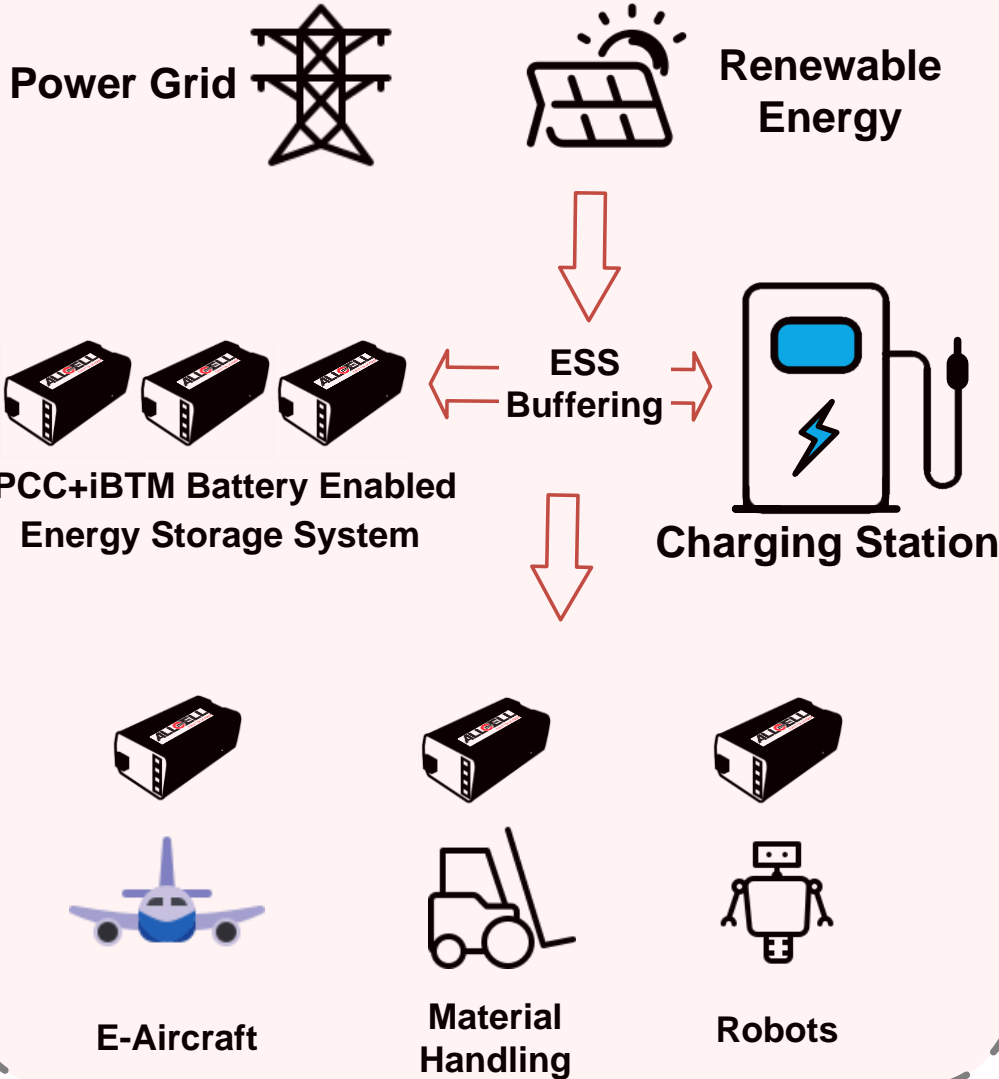


PCC Value Proposition

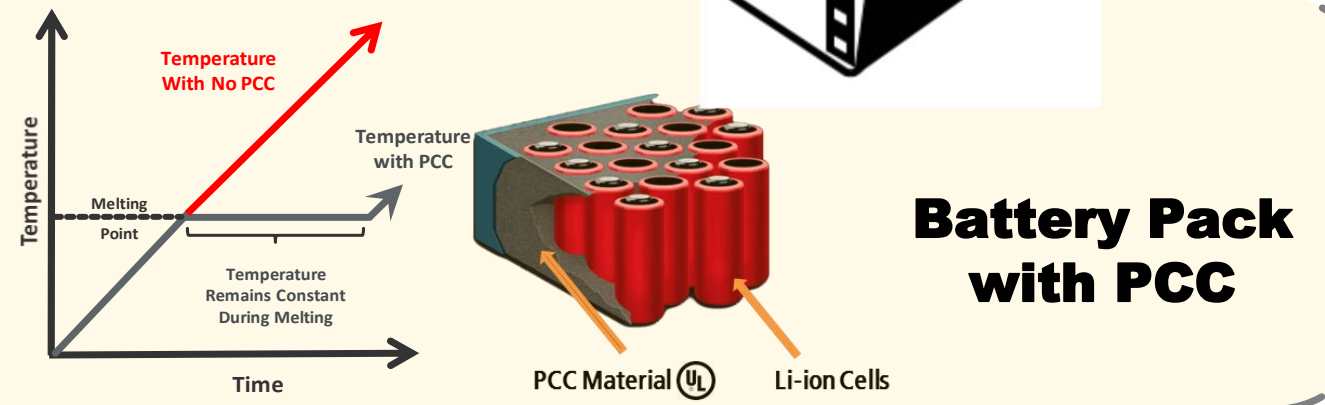
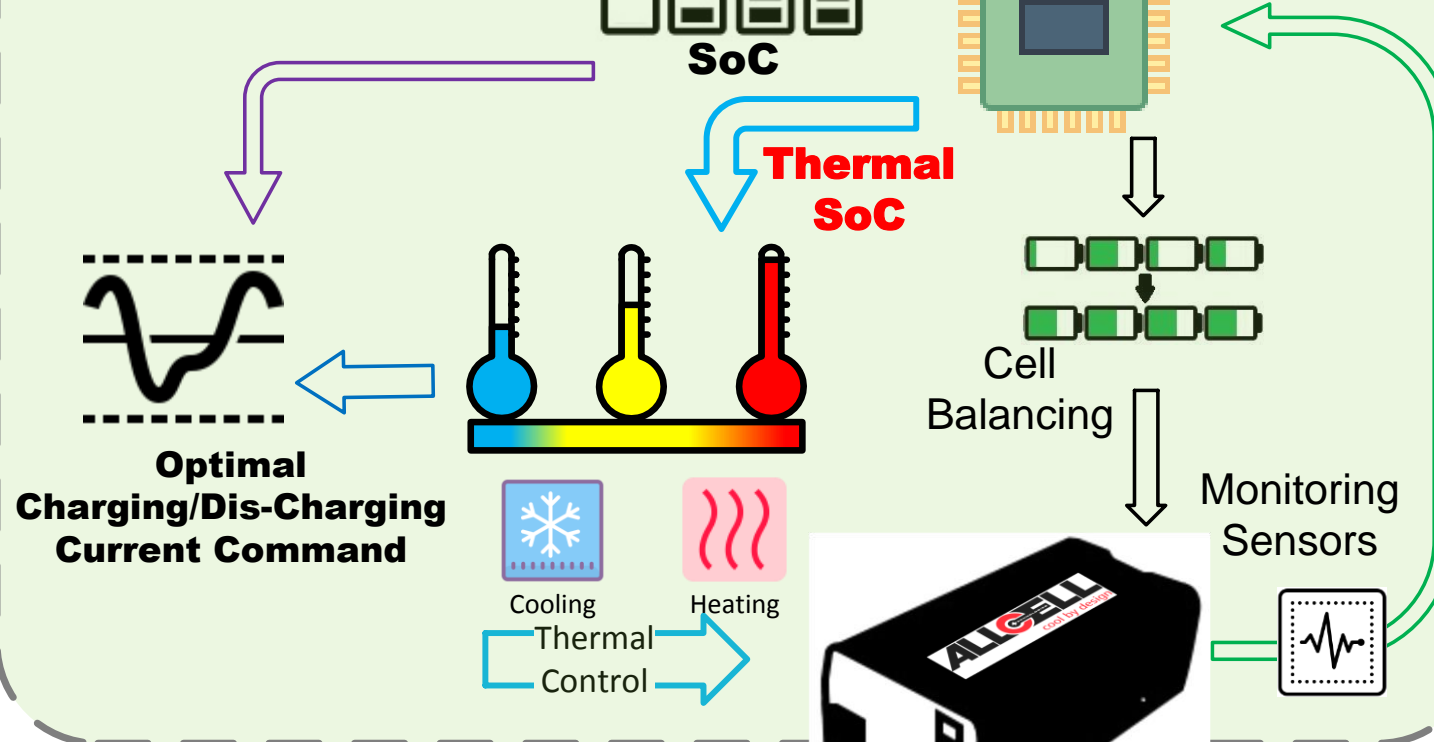


- PCC:
 - Prevents thermal propagation
 - Distributes and manages the temperature to improve cell life
 - Enables use of higher energy cells at a higher power through improved thermal management
 - Independently validated by:
 - Major eScooter customer validated life cycle testing
 - NREL (thermal testing and modeling)
 - UL (94-V0 certification)
 - Intertek (UN38.3)
- IP Portfolio:
 - Issued patents: 6 US, 1 EPO (France and Germany), 1 South Korea (2 new patents extend IP to ~2034)
 - Applications: 2 US, (filing in India, China, EU)

Integrated PCC + iBTM Solution



iBTM System Diagram

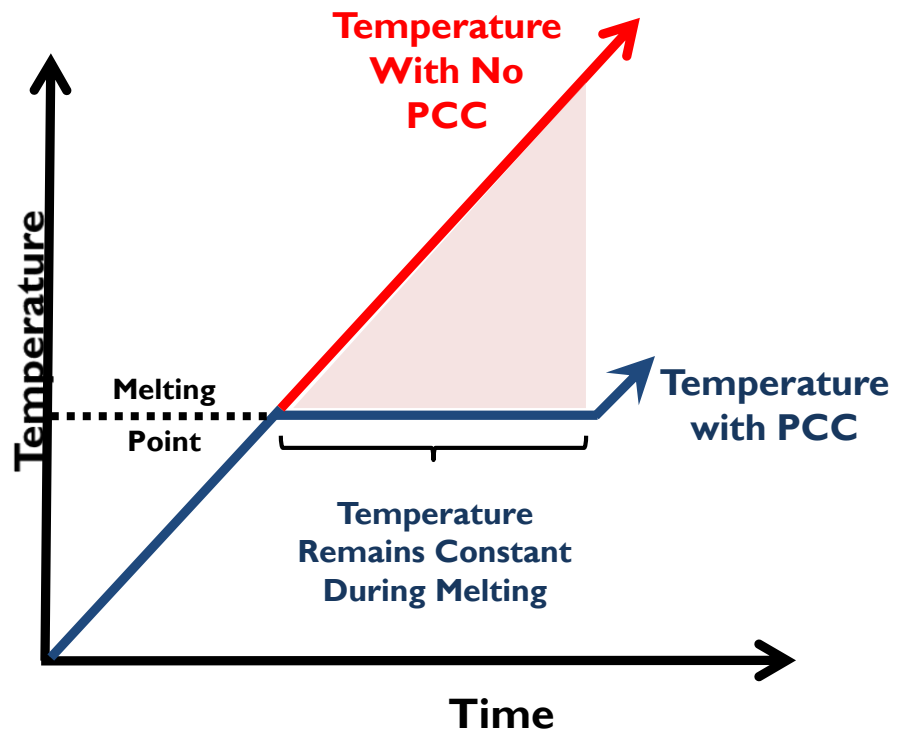


How Does AllCell's patented PCC Work?

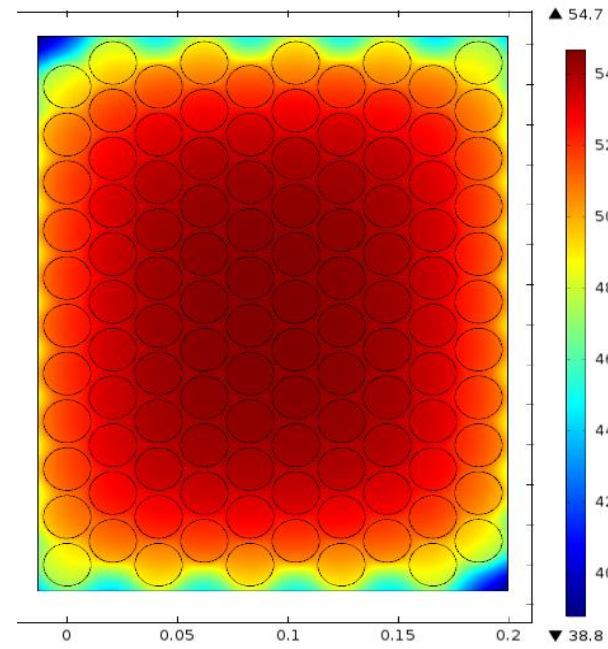
AllCells Phase Change Composite (PCC) consists of a patented and proprietary engineered graphite matrix designed for rapid heat dispersion, and an encapsulated **wax**, to provide optimum heat absorption.

Wax
absorbs heat as it melts

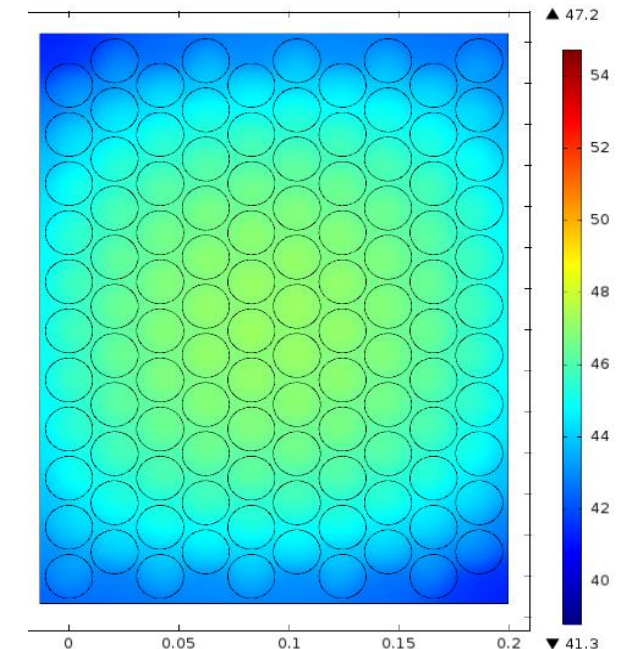
$$Q_{\text{absorbed}} = f(L_{\text{wax}}, m_{\text{wax}}, k_{\text{graphite}})$$



Graphite
distributes heat evenly – temperature gradient reduced by 50%, peak temperature reduced by 8°C



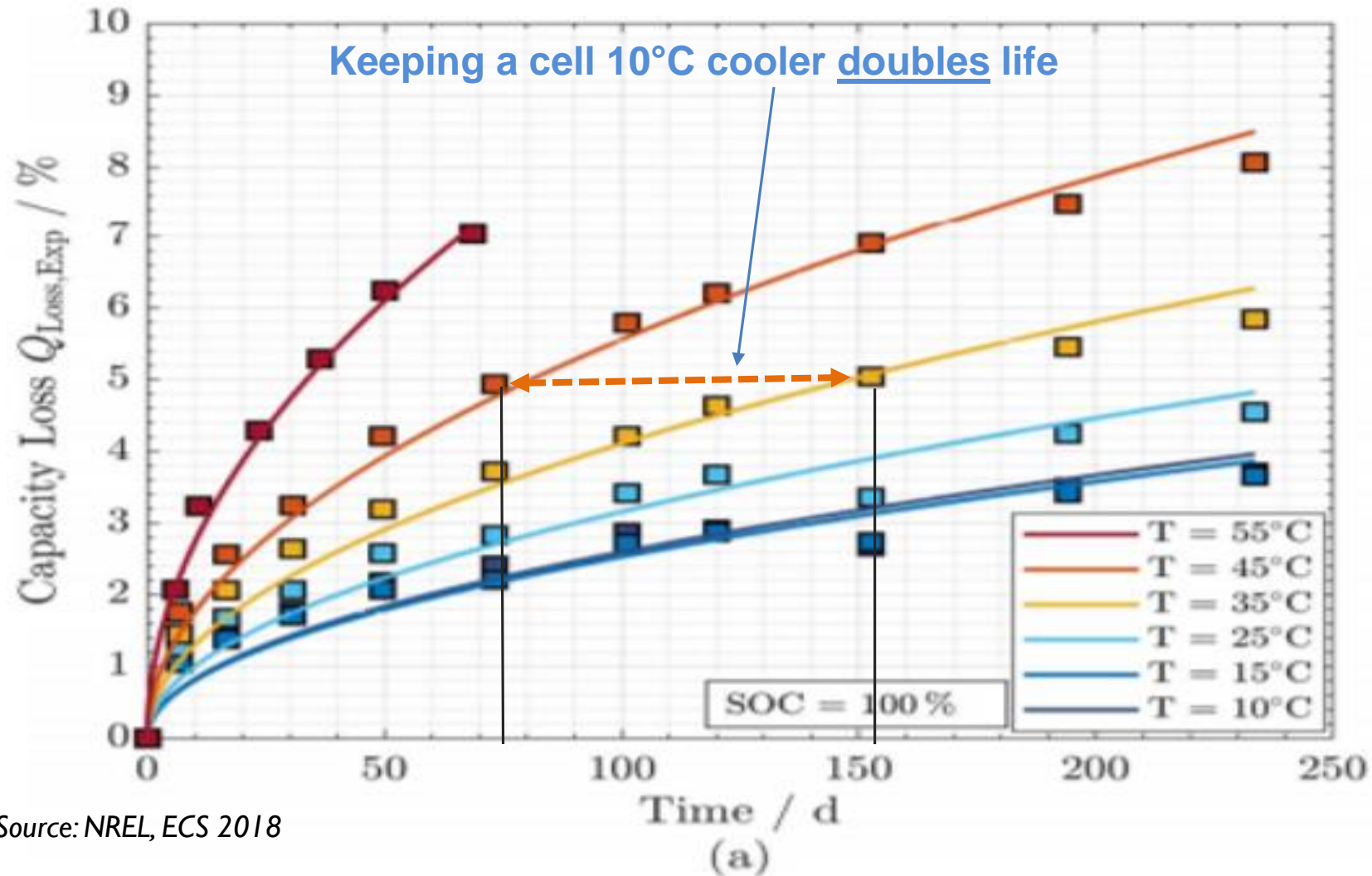
Pack temperature with no thermal management



Cool pack temperature with AllCell PCC

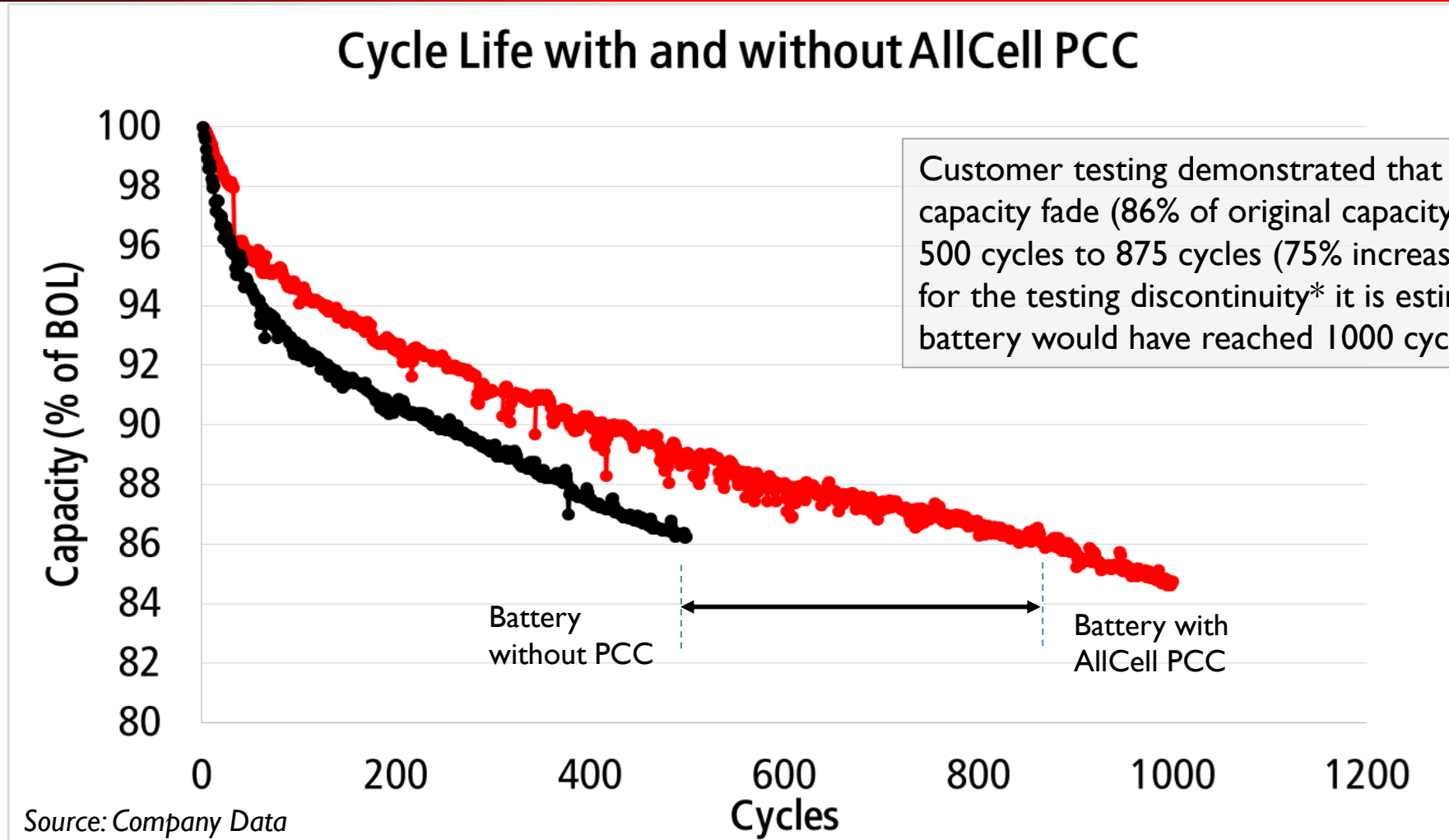
Impact of Higher Temperatures on Cell Life

Calendar aging of Li-Ion cells at different temperatures



Source: NREL, ECS 2018

AllCell solution significantly extends cycle life



* Customer test to demonstrate 1000 cycle capability at which point test was terminated. Discontinuity is the result of customer interrupting testing. State of charge and other key data was not available to AllCell for this interruption

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