

# LICAP

## Ultracapacitor Energy Storage



## About Us

LICAP, established in 2016, is a manufacturer of innovative ultracapacitor electrode material, ultracapacitor modules, and high quality ultracapacitors. and lithium ion capacitors.

The key element of our product performance is our industry leading dry electrode. LICAP's Activated Dry Electrode combines manufacturing efficiency with innovative fabrication methods that results in industry leading ESR, Capacitance, and Life Cycle performance.



## Common Applications for Ultracapacitors



**Bridge Power:** Ultracapacitors can be utilized to keep systems running until a long-term back-up power system can be brought on-line.



**Graceful Power Down:** When power is lost, some systems require seconds, or longer, to save information and shut down in a safe and controlled manner.



**Peak Load Shaving:** Systems with periodic peak power demands often result in an oversized and inefficient primary energy source. A bank of ultracapacitors can be designed-in to a system to handle peak power demands and enable a downsized primary energy source.



**Voltage Sag Support:** In some applications, there can be temporary power dips that will create problems with systems that rely on continuous stable power. In some cases, these power dips can be frequent and short duration.



**In the examples above, ultracapacitors provide the following benefits as compared to batteries:  
Longer life, maintenance free and high reliability.**

The peak load shaving example also includes the benefit of improved application efficiency by enabling a downsized primary energy source. In most cases ultracapacitors are replacing batteries. There are opportunities to combine ultracapacitors and batteries to enable a downsized battery, improved application performance and longer battery life. Please contact LICAP for additional information.

# Energy Storage Devices

## The Technology:

**Ultracapacitors, also known as Supercapacitors, or Electric Double Layer Capacitors (EDLC's) store energy electrostatically as opposed to batteries which store energy electrochemically.**

Since ultracapacitors do not rely on electrochemical reactions, they are capable of handling very rapid charge and discharge rates at high power, repeatedly. There is a limit on the amount of energy that can be stored in an individual ultracapacitor cell, the largest typical cell today stores 3.0Wh (3000F, 2.7V). However, these cells can be connected in series/parallel to meet any energy storage system size requirement, depending on space available and economic considerations.

Ultracapacitors excel in applications with short duration energy requirements where battery maintenance and replacement is costly, inconvenient or impossible. With a calendar life >10 years, there are cases where an ultracapacitor can be designed in to last the entire life of a system.

Attributes	ULTRACAPCITORS	LITHIUM-ION	LEAD ACID
Cycle Life	1 Million	1000	300
Calendar Life	10 Years	3-4 Years	2-4 Years
High Operating Temperature	+65°C	+45°C	+45°C
Low Operating Temperature	-40°C	0°C	0°C
Energy Density	Low	High	High
Power Density	High	Medium	Medium