

## RADIANCE ENERGY'S (RE) BATTERIES VS. STANDARD LITHIUM BATTERIES

### Extended Lifespan 01

- RE Batteries: **2 to 2.5** times longer lifespan.
- Lithium Batteries: Shorter operational life, requiring more frequent replacements.

### Fire Safety 02

- RE Batteries: Non-flammable, installable near buildings and side by side.
- Lithium Batteries: Flammable, require setbacks and spacing between units.

### THE CRITICAL ADVANTAGE: SPACE AND SAFETY

Radiance Energy's batteries deliver unmatched installation flexibility. They can be placed next to buildings, stacked, or set side by side—ideal for commercial use. Unlike lithium batteries, which require at least 6 feet of spacing and setbacks from buildings, RE batteries save valuable space. Smarter, safer, and more efficient, they simplify installation and maximize your options.


### Operation Time 03

- RE Batteries: 4–12 hours of reliable operation, offering extended use.
- Lithium Batteries: 2–4 hours of limited operation.

### Recyclability 04

- RE Batteries: Fully recyclable, promoting sustainability and reducing waste.
- Lithium Batteries: Limited recyclability, more environmental impact.

## COMPARING APPLES TO ORANGES: WHY OUR BATTERIES ARE IN A LEAGUE OF THEIR OWN

	Operation Time (Hours)	Lifespan (Years)	Maximum Lifetime Degradation	Round-Trip Efficiency	Depth of Discharge	Lifetime Performance Bonds	Levelized Cost of Energy (\$/kWh)	Degradation & Replacement Factored In?	High Value At End of Life
NonLithium LDES	4-12	20-30	3-12%	75-90%	100%	✓	\$	✓	✓
Lithium	2-4	7-10	40%	90%	80-90%	✗	\$\$	✗	✗

# RADIANCE ENERGY BATTERY SOLUTIONS

## NICKEL- HYDROGEN BATTERY

The Nickel-Hydrogen Battery is a next-generation metal-hydrogen battery technology initially developed for NASA and now adapted for commercial energy storage applications. It is recognized for its ultra-long lifespan, high cycle durability, and enhanced safety features, making it a compelling alternative to lithium-ion batteries for grid-scale storage.



Energy Storage Vessels can operate in extreme temperatures for 30+ years, offering the longest cycle-life of any battery system.



## KEY FEATURES

- Exceptional Durability: Over 30,000 cycles with minimal degradation.
- Long Operational Life: Expected to last 30+ years with continuous cycling.
- Safety & Reliability: Non-flammable electrolyte, eliminating thermal runaway risks.
- Extreme Environmental Tolerance: Operates in temperatures ranging from -10°C to 45°C.
- Round-Trip Efficiency: >90% peak efficiency.
- Scalability: Configurable in Energy Racks up to 300 MWh/acre.
- Minimal Maintenance: No augmentation required, low operational expenses.
- Depth of Discharge (DoD): 100% without risk of battery degradation.

## TECHNICAL SPECIFICATIONS

- Battery Capacity: 3.0 kWh per Energy Storage Vessel (ESV-4.0)
- Voltage Range: 1075-1500 Vdc
- Discharge Duration: 2 to 12 hours
- Cycle Life: ~30,000 cycles
- Degradation Rate: Less than 0.1% per year

Use Cases: Grid energy storage, commercial backup power, renewable energy integration

	Fire and explosion risk	High operating & maintenance expenses	Incapable of longer duration & dispatch	Limited cycle life
	No thermal runaway risk, No need for fire suppression	No augmentation, Low routine maintenance	Flexible charge/discharge range C/2 to C/12	30+ year lifespan ~30,000 cycles, 3 cycles/day
	Restrictions on over-charge and over-discharge	Harsh climates: hot deserts & freezing winters	Flammable liquids and toxic materials	High chemistry, adoption and technology risks
	Excellent overcharge, discharge and deep-cycle	Technology warranted for -10°C to 45°C	Non-toxic, no lithium, easily sourced	Proven in 30+ years of use in space applications

Challenge with Lithium-Ion technology compared with advantage of Nickel-Hydrogen Battery technology