ENDURIUM™

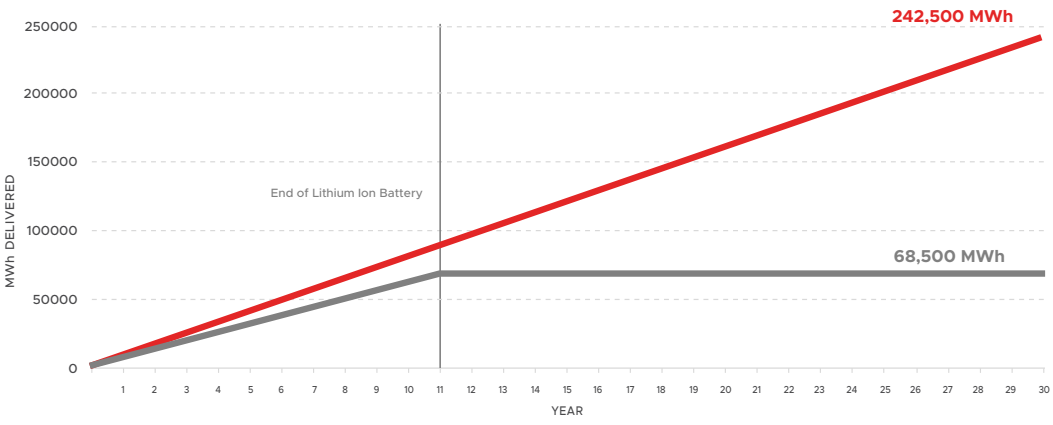


INVINITY ENDURIUM™ ENERGY STORAGE SYSTEM

Invinity's Endurium™ is an evolution of our proven modular vanadium flow battery technology, engineered for greater energy density, simplified maintenance, and greater economic value. At its foundation is a String of four Endurium™ Modules that stores 2 MWh of usable energy with flexible discharge durations from 3 to 18 hours based on the application. Strings are connected together into Arrays optimially sized for your application. Endurium™ Arrays can be combined to create 100 MW+ solutions that deliver unmatched throughput and flexibility.

- **MORE THROUGHPUT** Non-degrading chemistry delivers throughput superior to most stationary storage today.
- **MORE FLEXIBILITY** Adaptability to a wide range of duty cycles, with no warranty limits on cycle count.
- **MORE LIFETIME** Suitable for 30+ years of constant cycling, matching the lifespan of solar & wind assets.
- **MORE SAFETY** Zero risk of thermal runway; exceptional personnel safety for crews & first responders.
- **MORE SUSTAINABILITY** 99% of components are recyclable; vanadium electrolyte reusable at battery EOL.
- **MORE INSIGHT** Unparalleled visibility to system performance to understand and optimize asset performance.

CUMULATIVE ENERGY DELIVERED OVER TIME



Assumptions: 12 MWh capacity installed, 2 cycles per day, 100% DoD per cycle, 365 days a year. Lithium out of warranty/EOL @ 60% capacity. We charitably assume the lithium system can meet this duty cycle: its actual degradation is likely to occur much faster.

SCALABLE
3-100+
MW POWER

3-18
HOUR DISCHARGE

UNLIMITED CYCLES

UNLIMITED THROUGHPUT

NON FLAMMABLE

30+
YEAR LIFESPAN

INVINITY ENERGY SYSTEMS

ENERGY STORAGE WITHOUT LIMITS

ENDURIUM™

PRODUCT DATA SHEET

STRING SPECIFICATION

COMPONENTS
4x Vanadium Flow Battery Modules, 1x String Control Unit, Inter-String cabling

PERFORMANCE[1]	2 Power Blocks	3 Power Blocks
Max DC Power	400 kW	500 kW
Max Usable Energy[2]	2050 kWh	2065 kWh
Discharge Durations at Constant Power	3h @388 kW 6h @272 kW 8h @225 kW 12h @163 kW	3h @470 kW 6h @302 kW 8h @238 kW 12h @169 kW
DC RTE DC RTE (inc Aux)	73% 68%	73% 68%
DC Response Time	<15 ms from On; <1 min from Off	
Voltage Range	800–1280 VDC	
Max DC Current	500A	600A

OPERATING CAPABILITIES	
Duty Cycle	Continuous at Max Power. No rest period
Lifetime Cycles	Unlimited for 30+ years
Depth of Discharge	0-100 %
Cooling System	Forced Air
Communications	Modbus TCP/IP
Annual Energy Degradation	<0.2%

REQUIRED UTILITIES	
Auxiliary Supply	3Φ, 380-480 VAC
Auxiliary Loads (Idle/Average/Max)[3]	3 kW / 8 kW / 20 kW

CERTIFICATIONS AND STANDARDS[4]	
Certifications	CE, UL 1973,UL 9540A, Sub Assembly under UL 9540
Standards	NFPA, IEC 62933-5-2, IEC 62485, IEC 62932-2-2

ENVIRONMENTAL	
Ambient Operating Temperature	-10°C to 45°C / 14°F to 113°F
Relative Humidity	5-95%
Maximum Elevation	2000 m / 6600 ft
Protection Class	IP 54

FOOTPRINT	
String Footprint (inc/service access)	8.7 m x 10.9 m / 28 ft x 36 ft
Area	93.7 m^2 / 1008 ft^2
Array Energy Density	321 MWh/ha / 130 MWh/Acre

BATTERY MODULE DIMENSIONS (4 PER STRING)	
Dimensions	6.1 m x 2.4 m x 2.9 m 20 ft x 8 ft x 9.5 ft
Mass	36,000 kg / 79,400 lbs

NOTES: 1 Performance values are for operation with electrolyte at 35°C. DNV IE Study available under NDA. Contact Invinity for more information.
2 Usable DC capacity varies depending on discharge profile.
3 Aux load excludes cooling fans, which are temperature dependant. Average rating is for 6-hour discharge.
4 Expected in 2027.

CONFIGURABLE ARRAY

Example of a double-stacked, 10-String, 21-MWh DC Array, capable of delivering Max Power of 5 MW DC.
Strings are connected in parallel to form Arrays sized to match PCS capabilities.



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