

A Financial Analysis of Backup Power Alternatives

Organization: Major University Hospital Headquarter

~ Experiences regular power failures

Application: New backup power installation for server/PBX facility

~ 10 years of usage & 10 years of warranty

~ Backup power requirement: 200,000Wh

Option A:

48V/40A lithium battery pack

(Lithium Power ESS-500-48)

Option B:

2V/2000A VRLA-AGM battery pack

(Lead Acid Batteries)



Facts:

1. The average cost per Wh for the Lithium Power ESS-500-48 is \$1.74 vs. \$2.90 for lead-acid battery packs.
2. Space rental costs make up about 50% of Total Cost of Ownership (TCO) for lead-acid battery packs, at a rental cost of \$1 per square foot. Lithium Power ESS-500-48 is much more compact, and so takes up only 8% of TCO for space rental costs.
3. Lithium Power's cost advantage multiplies in metropolitan areas where rental costs are higher. Compared to lead-acid battery packs, Lithium Power ESS-500-48 can typically save up to 90% of space lease expenses in higher-rent areas.
4. Lithium Power ESS-500-48 also maintains 80%+ energy storage capacity for the full ten years. Lead acid batteries will last only five.
5. From the perspective of crisis management, the value of the battery management system to ensure power failure prevention is priceless.

Backup Power Requirements:

	Option B VRLA-AGM battery	Option A ESS-500-48	Remark
Backup power requirement	200,000Wh	200,000Wh	
Voltage (V)	2	48	
Current (Ah)	2000	40	
Wh per unit	4,000	1,920	
% of DoD	100%	100%	
DoD Wh per unit	4,000	1,920	
Cycle life*	300	600	
Units needed	100	106	

* SOH% of cycle life: 80%

Total Cost of Ownership:

	Option B VRLA-AGM battery	Option A ESS-500-48	Remark
Unit dimensions L x W x H (in/mm)	19.29 x 13.78 x 15.04 / 490 x 350 x 382	21.30 x 19.02 x 3.46 / 541 x 483 x 88	
Unit weight (lb/kg)	291 / 132	48.50 / 22	
Total weight (lb/kg)	291,000 / 132,000	5,141 / 2,332	
Unit price	\$2,100	\$2,900	
Total unit price	\$210,000	\$307,400	
Battery/cabinet/cable hardware cost	\$16,000	\$6,000	
Man-hour (hr)	80	16	\$200 per hour per person
Installation manpower cost	\$32,000	\$3,200	

Maintenance cost			
- Maintenance manpower cost	N/A	N/A	No additional manpower needed. Usually covered by service agreement.
- Self-discharging	\$600	\$120	\$0.5 per KWh
Self-discharge rate/month (20°C)	5%	1%	
- Lease expenses*	\$289,000	\$28,903	\$1.00 per square foot
Square feet	2,400	240.86	
Total cost in 10 years	\$579,600	\$348,823	
Average cost per Wh	\$2.90	\$1.74	
Warranty (80% SOH)	5 years	10 years	
Prevent backup power failure	No	Guaranteed	
The value of the prevention from backup power failure	N/A	Priceless	