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Lithium-ion based energy storage solution

Story by **R Srinivasan**

The battery technology (Lithium Ion) that powers your tiny handset, can now supply power to an entire building.

The company, ACME, claims that the 'world's first Made-In-India product', EcoGrid, will revolutionise the way energy storage is being used world-wide. The technologically advanced energy storage system, made in India by the company at its 27-acre plant at Rudrapur, Uttarakhand, was developed primarily for European grid-tie markets, in conjunction with solar power projects The company has just entered into an MoU with a European utility wherein it aims to commission 100 MWh of lithium ion energy storage by 2017, starting this year. The company has also developed an off-grid version of this product for the Indian market. The standard product offering for the market in India comes with a 5 kVA power rating and 6.6 kWh of storage.

A green technology product, it has no health hazards. The company aims to sell the 5 MWh EcoGrid in India this year.

It is a complete plug-and-play solution with in-built DC-DC and DC-AC conversion, which will revolutionise the manner in which energy storage functions. It also integrates with solar in line with the Make-In-India programme.

The company has also developed a range of high capacity Lithium- ion based solutions for industrial application to save production and productivity losses as well as wastage of raw materials. A similar solution is applicable for large buildings as an alternate source of back-up power. The company's corporate office at Gurgaon is India's only battery operated building (BOB) today with 270 kWh of storage.

Similar such solutions are also applicable as utility scale for rural micro grids and peak-shifting applications. The company is soon going to launch a micro site - www.ecogrid.in

KEY FEATURES OF A RESIDENTIAL UNIT

- Fast charging in 2-3 hours and is quickly available for the next need.
- Round trip efficiency of 95%.
- It occupies 1/5th of the space and 1/7th of weight of a normal conventional battery
- When there is no load, current conventional solutions continue to consume power whereas this solution goes into sleep mode, saving energy in the process.
- 4000+ cycle life .
- It has a large temperature variance of -10 degrees C to +55 degrees C
- The standard offering is 5 KVA / 6.6 KWH storage and it can be scaled up.

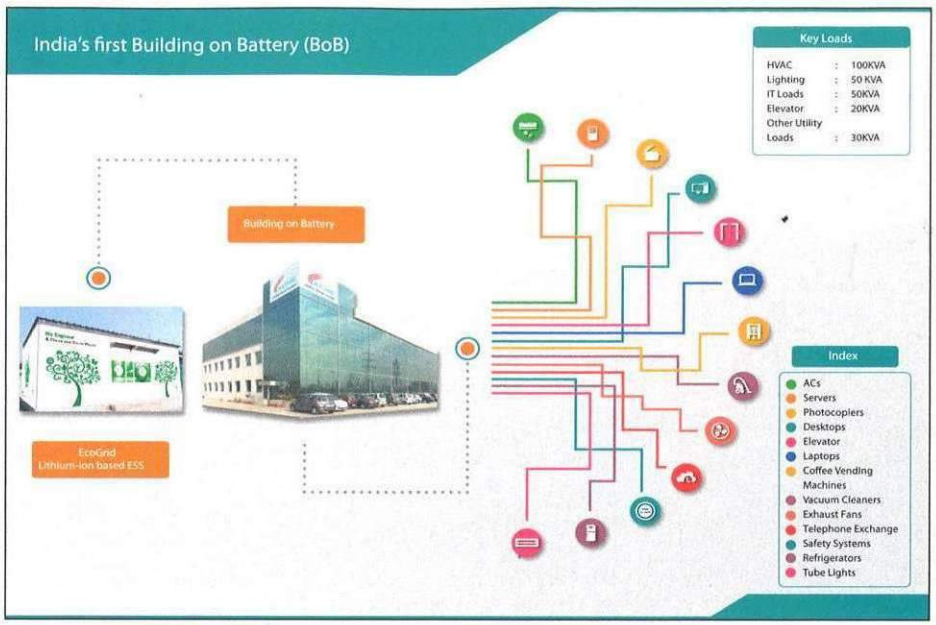
This casing contains the 270 kWh battery that powers the ACME corporate headquarters in Gurgaon.

FACTSHEET

1. **What is the total load of the building?** On average 250 kVA during office hours.
2. **Amperage – rate of flow** 360 Ampere per phase (3 phase supply)
3. **Storage capacity of the solution (in present form)** 270 kWh
4. **What kind of maintenance is required?** The solution requires no maintenance.
5. **Lifespan of this solution** 10 years of life considering 4000 life cycles.
6. **Components i.e. battery, inverter etc** Lithium-ion based (LiB), battery management system (BMS) and hybrid inverter. The Battery Management System is a kind of an equaliser that ensures that all the batteries in a system are charged and discharged equally.
7. **What is the source of power to the solution – solar, grid or DG set?** Currently the system is based on power by grid.
8. **Plans for the future:** Aim to install 5 MWh solutions in India by next year. The company has just entered into a MoU with a European utility for commissioning 100 MWh of Lithium-Ion energy storage by 2017.

Exports

Year	India	Europe
2016	5 MWh	
2017		100 MWh



Numbers

A 270 KWh of battery installed in an area of Six cubic metres, weighing about 320 kg is powering their 5 storey headquarters. Scale for reference: A normal 2 BHK house requires a solution of 5 Kwh.

How many organisations (other than USBD) have been supplied with this solution so far?
ACME has supplied Eco-Grid to many clients. To name a few:
a) Rely on solar: Installed on a guest house in Mewat (Haryana). System works with solar and grid input.
b) Safe Water Network (NGO): Installed to support a RO water purification system in Charoli Village of Uttar Pradesh. The system works with solar and grid.
c) High altitude application: Installed at 17,000 feet on the Indo-China border where the temperature goes below zero. The system works with solar and diesel generators

What is the cost of this solution?
A standard 5 KVA / 6.6 KWH product costs about Rs 3 lakh.

What is the total capacity it can supply? How many PCs, fans, lights, ACs can the ESS support?
ESS can support 5 kVA of load which is good enough for one AC, three fans, three light bulbs, one fridge, one TV and other small household appliances

By when will we see this solution being adopted across India?
We are already witnessing the adoption being initialised & customers are getting familiarised with the new technology. Mass-scale adoption should not take more than a couple of years.

The EcoGrid microsite is operational now.

Solution for Uttarakhand State Biotechnology Department

The company has commissioned its 5 kVA lithium-ion technology based EcoGrid Energy Storage System at an auditorium of Uttarakhand State Biotechnology Department (USBD) to support uninterrupted training and capacity building for students/ researchers/ teachers. With this installation, they will be capable to promote the uninterrupted learning on the subject and eliminate their dependence on the traditional alternate sources of power. The solution provides users with the ultimate reliable power experience, based on a proven sustainable Lithium-ion based storage technology. Lithium-ion batteries are used in all sorts of devices – power tools, notebook computers, tablets, cell phones and electric cars due to their distinct advantages over wet-cell lead acid batteries. Some advantages of lithium-ion are:

- Lighter
- Higher energy density
- Lower self-discharge
- Lower maintenance
- No "memory effect"
- Increased cycle life

The system comes with an option of inbuilt solar power integration. It stores energy from the grid and/or solar when available (prioritising solar power consumption to the fullest) and delivers power to loads, when the grid/solar fails to supply.

Based on inputs from ACME.