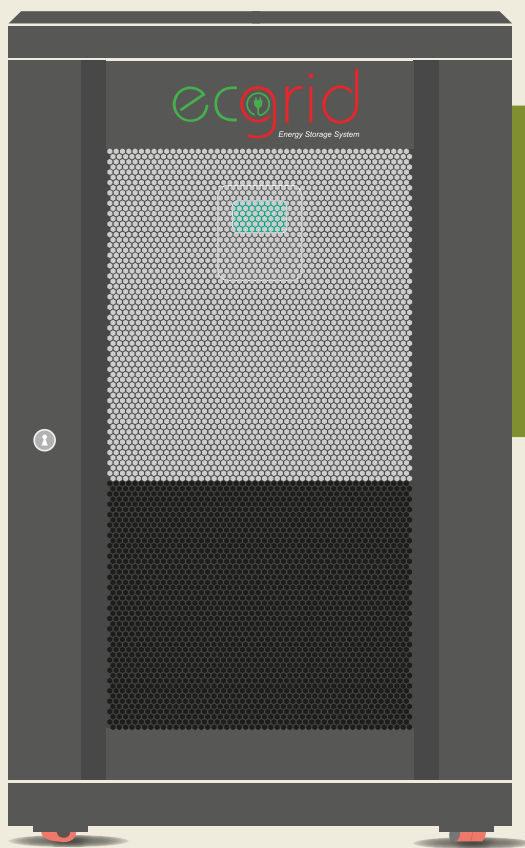


"Indomitable, they are.  
**FEARLESS,**  
they are."



## THE **GAME CHANGER** HAS ARRIVED

*No one deserves the title of a 'Hero' more than a soldier. The brave men guard one of the most notorious international borders which behave like a battle-field all around the year. But, thanks to EcoGrid which is successfully providing them power independence round the clock.*

[www.ecogrid.in](http://www.ecogrid.in)



EcoGrid installation at Indo-China border

**Setting New BENCHMARKS in the Energy Storage System**

**EcoGrid Energy Storage System** is already serving Defence Force as a vital component to provide them energy independence for their stationary applications. Here is a case study on how it is making a positive and major difference to them on a daily basis by solving their living and operating challenges.

The Indian Armed Forces are the prime guardians of our national integrity and sovereignty. Braving inclement weather conditions is a part of their life to protect & serve the entire length and breadth of the country including places which face extreme weather conditions. These places face following further challenges making living further tougher:

- No grid availability at most of the frontiers / forward locations.
- Un-reliable power because of frequent breakdown of distribution lines.
- Poor Quality of power due to distances – Substation and point of use.
- No preventive Maintenance - Frequent Damages of electrical / electronic equipment due to electrical fault.
- Sub-zero temperature making it difficult to survive (frozen water and Fuel)

Thus, they were left at the mercy of DG Sets. However, running DG Sets in High Altitude Areas (HAA) also comes with its own set of logistical limitations & technological challenges:

- DG Sets run with poor efficiencies and deration due to high altitude.
- Lack of trained manpower for DG Maintenance.
- Severe issues of Cold Starting.
- Improper Selection of DG Sets Sizing – Result in further inefficiencies.

### DG limitations in HAA

- **High Altitude:** Due to the low air density, the engine remains hot causing frequent overheating.
- **Temperature:** Due to inadequate oxygen levels available for combustion ignition and frequent overheating; it collapses regularly.
- **Humidity:** Low oxygen levels impair ignition.
- **Derating:** Every 1000 ft above sea-level, a gasoline will get derated by 2-3% of its standard output.
- **Fuel Problems:** Getting diesel in HAA is a very cumbersome & expensive affair. Also gelling of diesel fuel may set in a new challenge.
- **Logistics:** Heavy weight of generators pose another major problem.
- **Maintenance:** Frequent maintenance required – High fuel gas temp. Maintenance expenses are also a cause of concern.
- **Low Efficiency:** Low efficiency yields high energy cost.
- **Polluting:** DG Sets are highly polluting & also cause global warming.
- **Large footprint:** Placing them at High altitudes is very cumbersome and risky.
- **Security Threat:** DG engine makes a noise which gets traced by enemies.

To combat the limitations of DG Sets, Indian Army and Paramilitary Forces installed Solar PV and Wind Energy Systems with Conventional Lead Acid Battery based Energy Storage System. However, it was not successful as renewable energy source in HAA cannot function to full potential due to limitations with Lead Acid Battery banks.

### Lead Acid Battery Limitations in HAA

- Not working due to low temperature
- Low Efficiency
- Heavy Weight
- High Operating Cost
- Less Cycle Life – Frequent replacement
- Long Charging Time (Minimum 8 Hrs.)
- Polluting – Lead is a poisonous substance
- Large footprint
- Day to day challenges in smooth functioning

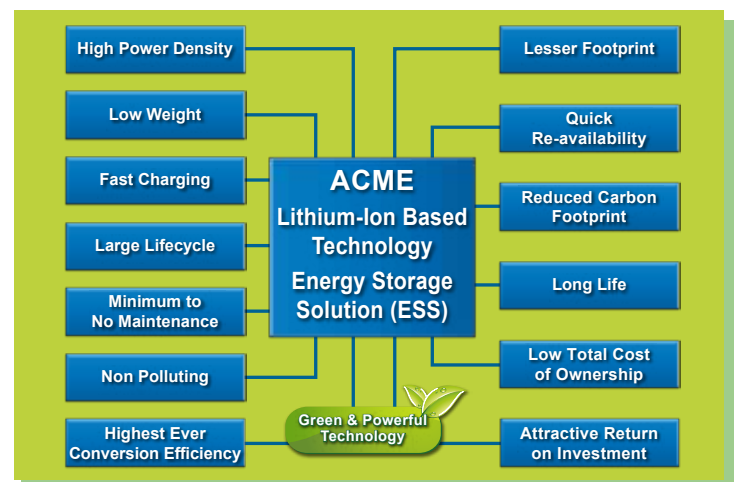
### The Long Sustainable Technological Solution

ACME experience in energy sector goes way back. Founded in 2003, our business focus is around 3E's – Energy Conservation, Energy Management and Energy Generation. Now with expanded vision, ACME has introduced game-changing Lithium-ion based EcoGrid Energy Storage System (ESS) which work successfully under any critical conditions and fit every application from residential, commercial to industrial.

Having worked for more than 5 years in HAA and after implementing multiple projects with Indian Army and paramilitary forces for making the comfortable living conditions; ACME introduced EcoGrid ESS customized for HAA after listening to their problems and challenges. These systems were successfully tested during winter trials in High Altitude Areas. EcoGrid ESS provides very high efficiency, 10 years lifetime and deep-cycle capability —thus providing a better ROI and cost efficiency to them as well as no hassles. Additionally, it requires less than one-third the space as compared to other solutions.

We are happy to serve our Defence Forces and take pride for successfully accomplishing this project & solving their challenges. With the installation of EcoGrid ESS, they are able to harness renewable energy and reduce their dependence on Fossil Fuels & Diesel.

### EcoGrid ESS at glance



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