

THE COMPLETE ENERGY SECTOR MAGAZINE FOR POLICY AND DECISION MAKERS

CLIMATE CHANGE:

Can India move away from coal?



Lack of coal demand
poses fresh challenge to
the Government

India needs to invest in
Smart grid to be a low-
carbon economy



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Energy storage to play key role in grid stabilization

Prashant Panda, President, Solar Business, ACME Solar, feels that as India expands its power capacity addition, both thermal and renewable, it will need energy storage solutions to guard against challenges arising out of grid stability. According to Panda, Energy Storage can play key role in grid stabilization through operations such as Frequency response, peak shaving and time shifting.

Today, we can witness the change in the country's power sector. India is expected to have surplus power supply in financial year 2016-17 with the continuous addition of new power generating sources including renewable sources and also an improved supply of coal to thermal power plants which have a lion's share in total power generation scenario of our country. However, a large populace of the country is still bereft from continuous supply of electricity and load shedding is still a perennial problem in many areas. Many rural localities are still waiting to be connected to the main Grid. But with the impetus being given by the government, to 24/7 supply to all, these ills will soon be overcome.

When we look back and see the transformation in the sector in the last decade where the country was reeling under severe power crisis and the spot price of power at exchanges touched a new height and the current scenario where the cost of power procurement at exchanges is cheapest of the entire available power supply contract chain.

India has an installed power capacity of more than 305 GW, of which renewable energy has a share of more than 14%. At current pace,

India seems to be on track to achieve its ambitious target of having 40% of the power generation from renewable sources by 2030.

The game changer for this transformation can be grouped into three broad categories. First, the improved supply of fuel to thermal power plants with an increase of around 11% in coal production and the reverse auction of gas supply through price pooling of domestic produced gas and imported LNG to the once idle gas-based plants to generate power at affordable price. Second, the addition of new capacity in both thermal and renewable energy sectors by giving clearances to Mega/ Ultra Mega thermal power projects and setting national goal of having 175 GW of installed renewable energy capacity by 2022. And third, by policy and regulatory support, where distribution companies which were making high losses can make a turnaround by reducing their

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Prashant Panda, President, Solar Business, ACME Solar

financing cost to reduce the debt burden and make more investments in upgradation of infrastructure for transmission and distribution of power, and purchase more power from renewable energy sources to fulfill their renewable purchase obligation under the new National Electricity Policy.

ACME has been an industry leader in solar power generation with an operational capacity of 514 MW and more than 1.1 GW of power project under various stages of construction and implementation in different parts of the country. We have committed to the Government at the Re-invest 2015 to develop 7500 MW of Solar Projects during the five year period of 2015-19. Besides, generating 12000 Million Units of green and clean power annually, these projects will also create employment for nearly 4000 persons, directly and indirectly and prevent Carbon Emissions of around 10000 MT per year.

Today ACME is recognized as the leading solar power developer in India and expanding rapidly for global footprint. We have been able to add nearly 1100 MW of new Solar Projects through bidding in various tenders since April'2015.

Energy storage technology

Energy Storage is one of the key focus areas of ACME and we are developing various customized solutions to meet application specific requirements. Growing level of integration of Renewable energy sources on to the main Grid and given their intermittent nature makes it imperative to bring in Energy Storage solutions (ESS) in Indian context. Grid stability becomes a major issue when there is substantial addition of energy through renewable sources, which are intermittent in nature. Energy Storage can play key role in grid stabilization through operations such as Frequency response, peak shaving and time shifting.

Energy forecasting which could become a major requirement with increased level of Renewable can be made possible by having ESS in place. Apart from the large scale grid level storage systems, equal importance has to be given towards distributed storage systems at residential and micro grid level that can also bring energy independence to individual users.

Another important segment where energy storage brings value is EV to building or EV to Grid. With aggressive plans across the world to introduce Electric Vehicles (EV), this segment is going to clearly influence the Energy storage markets. Energy storage uses various methods to store excess energy to be used at a later time which in turn allows the energy providers to balance between the demand and supply. A number of devices and media are used to store energy, while their selection



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depends primarily on the source of energy and the intended use. There are a lot of competing technologies that are available to store the energy. However, it is important to choose a

right solution for right application.

Energy storage in this context is not just a back-up power source that is used only when grid is not available. Storage element is not going to be operated in floating applications as it is being used presently with the conventional storage technologies. However, Energy storage unit is subjected to a daily cycling when it is used in conjunction with renewable sources or Electric Vehicles. This brings a challenge of cyclic life for an energy storage unit. ESS shall have the capability to be used either as an Energy source for applications such as grid and also as power source for applications as in Electric Vehicle. In this context, we see Lithium ion battery clearly emerging as a favorable choice. Growing use of Lithium Battery in Electric vehicle is driving the demand worldwide and bringing its cost down. Benefits out of Electric Vehicle industry can be utilized for Grid scale storage also.


It is very important for the country to initiate few pilot projects, gain experience to deal with the grid scale

storage systems. Though large scale storage systems are already installed and operational in countries like Germany and Japan, we do not have any thing operational in India. While it is helpful to learn from what has been installed already elsewhere in the world, it is important to establish proof of concepts in India. This helps the industry to learn what challenges are there in Indian context and also

frame regulations and policies around this segment.

It has also been observed that distributed energy storage systems are already being considered for ancillary services, particularly as a Primary Control Reserve, in some countries like Germany. This gives an additional facility for individuals to participate in ancillary services. This needs a smart grid to be available,

falling in line with the Government's vision of creating smart cities. While there are handful of applications and numerous advantages with Energy Storage solutions, it is important for the authorities and industry to clearly define the use cases, frame guidelines and standards so that the segment can grow as an organized segment.

Realizing this impending need of Energy Storage, ACME has already installed Lithium Ion battery based Energy storage systems, and established working examples in various segments like rural micro grids, Renewable integration at high altitude areas and building solutions. It is also giving that extra push towards localizing PCS, EMS and battery assembly in India under "Make in India" initiative. 

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*The views in the article of the author are personal
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