MARKET SURVEY:

Green Power Backup Solutions will be the Next Big Thing in India

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With focus steadily increasing on renewable energy, the uninterruptible power supply (UPS) and inverter industry is slowly coming up with systems that are compatible with various renewable energy sources. Manufacturers are also investing on creating products that are energy-efficient, highly reliable and robustly designed with a lower total cost of ownership. Let us take a look at the drivers of the industrial power backup industry, products in demand, market trends, government policies and industry experts' views on the future of this segment.

Growth factors

The foremost and primary driver of industrial UPSes and inverters is severe power deficit and the consequent frequent power cuts across the nation. Unpredictable power cuts have become a major concern for the corporate sector, feels Moumita Mukherjee, research analyst, Netscribes. She says, "Currently, dedicated power grids to meet domestic and industrial power needs do not exist in India, as a result of which some key segments like e-commerce and data centres rely completely on uninterrupted power backup."

It would be fair to state that UPSes and inverters have a good market share in India because of the non-availability of a strong grid system. UPSes are required in offices where computers or servers are stationed and uninterrupted power is needed. "If computers and servers go down for even a minute, it creates a lot of problems for organisations dependent on these," says R. Sivarajan, R&D head, Su-Kam. He adds, "The reason for UPSes to be used for high-priority applications is because there is no transfer time required." It is also advantageous for internal lighting loads, fans, coffee machines and other appliances.

Anindya Das, industry manager, Energy & Environment Practice, Frost & Sullivan, says, "Sizeable demand from information technology (IT)/information technology enabled services (ITeS), banking, financial services and insurance (BFSI), government, infrastructure, healthcare, education and manufacturing sectors are driving the UPS market in India." Also, almost every business is connected with the Internet. A lot of trading activities also happen via the Internet.

"Servers host all data and if it is not backed up by UPS, it puts the data at risk," says Sivarajan. "From small-scale entrepreneurs to large multinationals and conglomerates, it is very important that all corporates having critical data hosted on servers must be protected by UPS," he adds.

In sectors like IT/ITeS and BFSI, investment in power backup systems comes from major corporate consumers like TCS, Cognizant and Tech Mahindra, informs Chandrashekhar Prakash Rao, sales director, Secure Power for Industry & Infrastructure, Schneider Electric. These require UPS and inverter systems for their enormous campus-

es, development centres and business process outsourcing (BPO) establishments in India. He says, "If you look at telecommunication as a segment, telecom network infrastructure roll-outs like 3G or 4G are the major driving factors for Telco." He adds, "With rolls-out, multinational companies come up with main switching centres, distribution centres or data centres that require power backup."

The broadening gap between demand and supply of power is another key factor for the growth of industrial inverters and UPSes. Fast-growing industrialisation, which has a positive aspect of the country's economic growth, comes with a difficult concern for the demand to keep pace with the growing infrastructure.

According to Malvika Sood, senior technical sales engineer, Texas Instruments India Pvt Ltd, the present inverter market in India produces about seven to eight million inverters per year and the growth is five to six per cent per year. She says, "Earlier the business was focused mainly on tier I and tier II cities. Now, with improved power situation in India, focus is also shifting to rural India." She adds, "As per McKinsey & Company's analysis report, total demand for power will rise from 120GW to 315GW by 2017. As the inverter industry thrives on shortage of power, this is the area where UPS markets have the greatest potential and see a speedy growth."

Today, the corporate sector's presence is not only felt in urban cities but is slowly trickling down into smaller towns as well, informs Sivarajan. He says, "The power scenario in developing cities and towns is not very promising." Das too feels that the increasing penetration of IT/ITeS sector in tier II cities has boosted the UPS and inverter market.

Low-harmonics, high-efficiency and wide-power-range products in demand

With respect to the corporate and industrial sector, it is the high power range of UPS systems that primarily experiences the maximum demand, informs Moumita Mukherjee, research analyst, Netscribes. There is also a high demand for systems where customers can assess the total cost of ownership, which helps them reduce additional expenses in the long run.

Rao says, "Low harmonics and high efficiency are some other sought-after specifications. UPSes and inverters that contribute to a clean environment are also in demand." He adds, "Gone are the days where customers looked for preventive maintenance. Today, customers expect vendors to give some element of predictability, with respect to harmonics, in UPSes and inverters."

Growth factors at a glance

- Power deficit and the consequent frequent power cuts
- Unstable power grid
- Rapid industrialisation
- Telecom network infrastructure roll-outs
- Penetration of IT/ITeS sector in tier II cities

The UPS market is slowly moving towards transformerless and modular UPS systems, notes Das. This is mainly due to space constraints and rise in Leadership in Energy & Environmental Design (LEED) certification in buildings. He says, "Initially, inverters were used to operate fans and lights but now these are designed to run desktops, air-conditioners and other household appliances."

The industry is also looking towards setting up offices and factories more efficiently. Sood says, "Products with high efficiency (about 80 to 90 per cent) are in demand, which is met by sine-wave inverters. Consumers are not only asking for higher-efficiency products but are looking to save power as well."

She adds, "There is also notable rise in demand for solar inverters, which not only cultivates natural resources during the day but also charges batteries to supply power at night. Lower-rating solar inverters, also called hybrid inverters (combination of solar panel and inverter) of up to 500W or so, are available as catalogue products with tier I inverter manufactures." Higher-rating products are customised as per the requirement from the industry.

Multinationals dominate UPS segment, Indian companies have the edge over inverters

Analysts and industry experts feel, multinationals like Schneider Electric and others rule the UPS market in India today and Indian players do not have a great market share. Indian companies are also trying to supply products with the same kind of reliability as required by corporates.

Inverter-operating conditions are slightly stringent, given the power condition in India. Products made locally are completely based on the experience that manufacturers have with local grids. "For instance, the grid in the USA or Europe is completely stable. Their inverter systems need not be as rugged as the ones made for Indian conditions, where the frequency could go below 45Hz or above 55Hz for a 50Hz grid," explains Sivarajan.

He adds, "Standard voltage of 230V in India can dip to as low as 110V or 120V. Therefore power backup systems for usage in India need to be designed keeping such conditions in mind. Indian companies like Su-Kam try to understand grid-voltage levels and other conditions in cities and villages, and design systems accordingly."

Market trends

In the recent past, there has been a rise in consumers' growing affinity towards high power, cost-effectiveness and energy-efficiency. Mukherjee says, "With a continual rise in awareness about eco-friendliness, Green UPS technology is gradually gaining momentum in India.

Customers are willing to experiment with new technologies. Rao informs, "For instance, in the IT

industry, they are opting for high-end insulated-gate bipolar transistor (IGBT) UPSes, which offer low harmonics and high power factor. They are also keen on reducing the carbon footprint and operating expenses by a target percentage set by themselves."

Earlier, in rural sectors, people were tolerant towards long power cuts. However, there has been a change in the behaviour pattern of people as they are now opting for backup solutions, notes Sood. She says, "People are also demanding efficient systems and the trend is shifting to solar-powered systems with maximum power point tracking (MPPT)."

Rao feels, customers have still not seen the actual benefit of solar inverters. He says, "It has a prolonged payback period of more than 10 years. Maybe three or five years down the line, we can expect solar inverters to trend but at this stage solar inverters are not in major demand."

On the other hand, Sivarajan notes, "When you are investing on a 500VA or 800VA solar inverter, the payback period might be a little longer but a solar panel lasts for a minimum of 25 years. Even if you are getting the return on investment after five years, it is still worth it." He adds, "Consumers are already reaping the benefits of solar inverters."

According to Rao, three- and four-level inverters are quite the trend in the market today. He says, "These inverters achieve very high switching speeds, low harmonic distortion and high reliability with a compact footprint." Maintenance is a key parameter that consumers consider today while choosing a secure power solution. He adds, "Advanced battery-management solutions and fire-proof batteries are some other trends in the UPS and inverter industry."

Three-level inverters are inverters with three levels of switching. Sivarajan says, "These provide slightly greater efficiency and nothing more than that." He adds, "The end customers, that is industrial or corporate users, do not exactly understand three- or four-level inverters. They look for a reliable power system that gives them backup whenever required." At the end of the day, the technology that the customer chooses has to serve the purpose of reliability.

> The increasing penetration of IT/ITeS sector in tier II cities has boosted the UPS and inverter market

Battery indicators in power backup systems is another trend picking up in the market to make the consumer aware of the battery life status. Sood says, "This is possible with inverters having battery management systems in place. Such solutions are already available in the market with tier I suppliers." She adds, "All inverter manufactures are also looking to reduce the size of inverters by switching to high-frequency inverters. Such inverters would require smaller-size transformers, and will also help in reducing the overall cost other than improved efficiency."

Talking about high-frequency inverters, Sivarajan claims, "We have launched a new high-frequency inverter that has an efficiency of more than 90 per cent. If you consider a regular transformer based inverter, it provides a maximum efficiency of 80 to 82 per cent." He adds, "Technology is playing a heavy role in minimising the losses in inverters for better conservation and battery life."

Government policies

Recently, the solar energy sector was in for good news on the first day of the new year, as the Haryana government has issued a directive to have rooftop solar power system installed in every building of the plot size of 418.06sqm (500-square yards) or more. Systems are to be installed by September 2015, informs Sood. She says, "The order will be applicable to private bungalows, group housing societies, builder apartments, malls, offices, commercial complexes, schools, hospitals (any building, new or old, that meets the plot-size criteria)." She adds, "Adding to the incentives for developers, the government will offer a 30 per cent subsidy on installation costs on first-come-first-served basis."

Also, with several state governments in India promoting the usage of solar power by announcing several policy changes, the hospitality and retail industry has shown early signs of adoption. Mukherjee says, "A number of vendors are working on solutions based on solar power. It will be interesting to observe the rest of the industrial community in India responding to solar-powered UPSes and inverters."

In some states, if a UPS that gives very high power factor to the source is deployed by manufacturing plants, IT organisations and other industrial facilities, the state incentivises their electrical consumption, informs Rao. He says, "There are also regulations coming from electricity boards to maintain the harmonics within certain limits. For a clean electricity environment, it is necessary for UPS manufacturers to adopt technologies such as IGBT. This benefits customers by not inducing high amount of harmonics to the source." He adds, "Our recommendation to the government would be to restrict measurable parameters, such as harmonics, to five per cent on the input side and power factor to 0.95."

Adding to the recommendations, Sivarajan says, "I would like the government policies to be 'Make in India' friendly so that Indian companies into manufacturing power backup hardware systems can benefit from better taxation system, infrastructure and road transportation system. There should be a simplified taxation system for a business to grow in India." "The initiatives towards building infrastructure to promote hardware industry from the new government looks good but it is too early to rate these," he adds.

Pricing trends

Prices of commodity items like copper, aluminium and steel are only increasing, so there are always challenges to keep the product competitive, feel

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industry experts. Sivarajan says, "The cost of semiconductor is falling every day, be it microcontrollers, metal-oxide-semiconductor field-effect transistors (MOSFETs) or IGBTs, which impacts the overall pricing of power backup systems."

"We cannot continue using power backup systems with older technology. Prices of products incorporating newer technology will be on the higher side in initial stages, but the advantages these will offer will prove tremendous later," he adds.

Indian inverter market is divided into sine-wave and square-wave inverters. Sood notes, "North India is price conscious and [people here] go for square-wave inverters, which typically cost around ₹ 4000, whereas South India is more technology conscious and [people there] opt for sine-wave inverters, which cost around ₹ 4500."

Powerful future for UPS and inverter industry

The future of the UPS and inverter market, especially in the industrial segment, seems bright. There is traction towards renewable energy systems like solar inverters and converters. Sivarajan feels, "In the coming years, we must shift our dependency to solar instead of generating more power from non-renewable sources."

Bureau of Indian Standards (BIS) and Bureau of Energy Efficiency (BEE) standards, which focus on safety and efficiency of inverters, are still to be implemented. Sood says, "With BEE standards, demand will slowly decline for square-wave inverters. Also, with new government policies and subsidies being offered, solar systems will be gaining momentum in the market."

She adds, "Renewable systems see a very huge growth potential in the corporate inverters market. Although inverter companies are already working towards this solution, there should be policies in place for encouraging development of inverters that will feed back power to the grid."

The per capita consumption of electricity in India is about 1000kWh and the worldwide consumption is 2600kWh. Even as power generation increases, demand is bound to increase in India, feels Sood. She says, "As power conditions improve, we do not foresee that electricity will be available 24 hours in near future. We will also see more people using hybrid inverters, which are a combination of solar and grid power to provide optimal use." She adds, "Inverters in future will not only help create backup for devices but will also be smart enough in order to manage power."

Sivarajan feels, the future will move towards direct current (DC) systems. "Traditional inverters converting DC to alternating current (AC) have their own conversion losses. Complete home lighting and fan application will be driven towards DC for the higher efficiency and safety these provide." He adds, "Lighting will be on light emitting diodes (LEDs), which run on DC and we will have DC fans in ceilings."