Over the years, energy management has become a key area of concern for the Indian tower industry. The industry has started exploring a host of solutions and strategies including energy efficient equipment, hybrid solutions, green energy deployments and energy storage solutions. These have helped telecom companies in bringing down their energy consumption and achieving operational efficiency. However, there is a need to improve the financial viability of these solutions and strategies to ensure high returns on investment with lower operations and maintenance (O&M) costs. Industry experts share their views on the emerging trends in the energy management space... (*From left – Rajesh Bansal, Vice President and National Head, Energy, Indus Towers; Tushar Kapadia, Vice President, Strategic Initiatives, GTL Infrastructure Limited*)

What are the key energy management practices adopted by your company? What are the key challenges faced when implementing energy management solutions?

Rajesh Bansal

We aim to make our business operations diesel- free by 2021. Our energy management practices are designed to reap benefits from clean sources like all renewable sources or grid-sourced electricity. We ensure efficient use of energy by curtailing the use of greenhouse gases (GHGs) emitting diesel and increasing the utilisation of clean energy sources simultaneously. This is in line with our commitment towards preserving our environment along with meeting the growing demand for our services. Since 2011, we have been the first company to introduce green sites and green cities without compromising on network uptime. For green sites, we prevented the use of diesel, which, in turn, reduced GHG emissions and costs of improving network reliability substantially. This programme has helped in saving 210 million litres of diesel since 2011-12. Further, we were able to reduce CO_2 emissions by 567 tonnes, which is equivalent to the planting of 14 million trees.

We further optimise our energy consumption by designing energy-efficient cooling solutions at

Indus Towers. To this end, we have initiated the indoor-outdoor conversion programme through a series of innovative cooling solutions. To maintain active instruments at the required cooling temperature, air conditioners (ACs) have been replaced with free cooling units (FCUs). These units are specifically designed to control the internal atmosphere. Further, solar-powered cooling units have replaced ACs at sites with a higher active load. In addition, we have devised innovative methods of deploying our batteries using combo solutions, turbo solutions, variable speed diesel generator sets and micro-cooling solutions that target sites with temperature-sensitive equipment and cool them separately. Our innovative solutions ensure that an optimum amount of fuel is used to ensure a minimal environmental footprint.

Tushar Kapadia

Energy management for tower sites emphasises on improvement in the energy opex through operational efficiencies and optimal capex of energy systems. On the supply side, our focus is on utilising grid power as a preferred source and thereby, reducing diesel usage. On the demand side, we are making efforts to work together with the respective telcos and facilitate their 2G indoor base transceiver station (BTS) swapping with outdoor BTSs in a weather-proof enclosures. This has led to the reduction of energy overheads of air conditioning. Further, 4G technology predominantly utilises the remote radio unit and the base band unit (RRU+BBU) forms of BTS.

What has been the industry's experience in terms of adopting green energy solutions?

Rajesh Bansal

We have been prominent in fighting for a "green home". To this end, we employ renewable sources of power that sets itself to change the landscape of telecom infrastructure providers in the country. The use of renewable power has been medicinal as illustrated by the fact that our diesel consumption has almost halved over the past five years. Our 15,000 field technicians get more than 60 alarms per day that tell them about the site condition. Now our energy solutions can easily map energy savings, and can improve the quality and reliability of our assets.

Tushar Kapadia

Implementing green energy solutions on tower sites is a two fold approach:

• Reducing the carbon footprint through various operational measures such as maximum utilisation of grid energy by installing DGs of adequate capacity and providing sufficient battery backup during grid outages.

• Deployment of renewable energy sources – solar, wind and clean energy such as fuel cells.

Towercos have deployed FCUs, natural cooling units, biodiesel, solar, wind turbines, hydrogen or methane-based fuel cells, etc. over the years. The industry has found FCU and solar photovoltaic (SPV) deployment suitable for bulk deployment on tower sites.

Tower sites have a typical total area of 250 square metres and 100 square metres for ground-based tower and rooftop tower sites respectively. The usable spare area suitable for SPV deployment is about 25 per cent. In urban locations, SPV installation is only effective in shadow-free areas. Hence, the economic viability of SPV deployment on individual tower sites compared to solar farms is not the same. Yet, SPV deployment on tower sites is a welcome step for the environment. Further, the government's rooftop solar scheme has certainly increased the awareness of citizens.

What is your outlook for energy storage solutions?

Rajesh Bansal

The telecom industry is one of the key consumers of energy storage solutions or battery banks. Further, it is one of the key enablers of diesel reduction. Historically, we have moved from normal lead acid batteries to advanced valve regulated lead acid (VRLA) batteries. With the improvement in lithium-ion batteries, the industry is looking forward to commercially sustainable storage solutions with improved backups. With improved grid availability across the country, there could be an opportunity to eliminate diesel from this industry, if we can find a right mix of

storage solutions and technology.

Tushar Kapadia

For tower sites, battery banks are the key energy storage solutions. VRLA batteries have governed this space for several years. In the last three years, new technologies such as lithium-ion batteries have witnessed increased deployment due to higher performance on parameters such as depth of discharge and efficiency. Further, lithium-ion batteries are suitable for electric vehicles as well. As a result, the cost of manufacturing lithium-ion batteries is likely to reduce.

Going forward, a holistic approach should be adopted for devising government policies on tax incentives for superior battery technologies, such as lithium-ion, across the automotive, telecom and other industrial sectors.

What are your views regarding the scope of energy O&M for towercos?

Rajesh Bansal

For energy efficient O&M, tower companies should look for ways and means to eradicate diesel as it is the costliest energy source. To this end, support from distribution companies along with a favourable regulatory environment can boost grid access and group captive/virtual net metered renewable energy solutions for telecom towers. Further, futuristic technology based on internet of things (IoT) and real-time analytics can lead to efficient O&M practices, especially for a distributed business operation like ours.

Tushar Kapadia

It is pertinent to mention that in recent years, the Indian telecom industry has experienced a paradigm shift in its focus from 2G to 3G and 4G long term evolution network expansion. The

revenue of telcos now is predominantly generated from data usage. This has directed the attention of towercos to the new scenario of deliverables, namely, higher network availability and minimisation of outages even during the night.

Small cells and smart city Wi-Fi deployments can generate alternative revenue streams and create a win-win situation for stakeholders.

How do you see operator consolidation impacting the energy requirement of the tower industry?

Tushar Kapadia

In the last 12 months, the Indian telecom industry has witnessed some telcos becoming non-operational due to business viability challenges and consolidation among the surviving telcos. Due to this, towercos have been affected with tenancy losses, reduced revenues and vacant towers.

The tower industry has been negatively impacted on various accounts:

• Presence of underutilised infrastructure

• Challenges to operate DGs at a reduced load

• Costs of operating vacant towers

• Reduced ability to pass on sharing benefits to tenants.

This challenging condition is likely to force towercos to look for innovative engagement models in the near future.

Going forward, what will be the key emerging trends, business models and strategies for energy management and optimisation in the telecom sector?

Rajesh Bansal

In the past few years, innovation and technology have penetrated across each function at Indus, be it driving efficiency, improving performance or ensuring sustainable outcomes. This has had a bearing on every goal undertaken, be it zero diesel, zero harm, employee engagement or customer and partner satisfaction. For instance, increased automation and remote management of site-related issues and insights generated through data analytics are helping us move closer to our vision of zero harm.

As mentioned earlier, IoT-based solutions will be powering energy management going forward. From a business model perspective, renewable energy service companies can support tower companies as a long-term partner, provided that the right kinds of regulations are in place in the power sector. An improvised net metering policy supporting demand aggregation for distributed business operations can help us in the future. Further, joint intervention by regulatory bodies in the telecom and power sectors will be of timely help to the sector. Moreover, an improved energy storage technology will continue to benefit us.

Tushar Kapadia

Over the years, towercos have brought tangible benefits to telcos by reducing or optimising energy opex though energy management. Further, towercos have enabled mobile network penetration and teledensity growth. It is also certain that in the current competitive environment with soaring subscriber expectations, towercos' services are core to a telco's business. To this end, telcos are keen to facilitate strategies and business engagement models with towercos, which will create win-win opportunities for both the parties.

(*The views expressed by Tushar Kapadia are his personal views and not those of GTL Infrastructure Limited.*)

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