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INNOVATING ENERGY

"How is Energy sector gearing up for challenges in COVID surge"

INSIDE STORIES

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EDITOR'S NOTE

The Covid-19 crisis presents an opportunity for Indian power companies and policymakers to chart out a sustainable growth path for the future. India is a developing country facing multiple socio-economic challenges that can only be addressed by nationwide, inclusive and sustainable development. Sustainable energy is a precursor to all efforts in this direction. Rating agency ICRA has estimated that demand for electricity in India will grow by 6 percent in financial year 2021-22 as compared to the previous year. The agency also expects India's additional power generation capacity to increase this fiscal year as compared to 2020-21, led strongly by renewable energy.

Renewable power and energy efficiency are at the heart of India's efforts to achieve climate and sustainable development goals under its Paris Agreement commitments. Despite the disruptions caused by the pandemic, India hasn't backed down from its renewable energy targets but has stayed on course to achieving them. Meanwhile, even as the demand for conventional fuel such as oil, coal and gas saw a sharp decline during the pandemic, renewable energy witnessed an upward trajectory – an indication of its growing importance in the times to come.

India's ambitious energy targets call for a significant overhaul of the country's energy systems and for a sharper focus on energy efficiency. Both of these can be enabled through suitable policy interventions and technology adoption. India's commitment to sustainable development is partially dependent on accessing some green technologies developed in other countries. India should therefore expedite actions to access this technology uninterruptedly and at an affordable cost. Or even better, we should develop these technologies ourselves. For starters, we should invest in locally manufacturing solar panels and battery-based energy storage systems. The latter, it must be noted, will play a crucial role in driving India's transition to greener energy.

The energy sector meanwhile should improve its operational inefficiencies by digitally transforming or augmenting its various core and auxiliary processes. Globally, companies that have done so have demonstrated greater resilience than their counterparts elsewhere. Technologies like Artificial Intelligence, Machine Learning and Big Data will enable better demand forecast, remote operations, easy collections, swift redressal, troubleshooting for companies in the energy space – both renewable and conventional. Digitalization has been particularly beneficial for utilities, as was evinced during the lockdown by the resilience of utilities that has employed smart metering systems.

The use of automation is yet another way for energy and utility companies to improve productivity and efficiency. A wide range of processes, including several core processes, can easily be automated. These include the validation of meter readings; the correction of wrong readings; the management of billing and statements; and even the setting up of new accounts. Demand Side Management augmented with Demand Response shall be effectively actualized through IoT based Feedback and Controls. Network strengthening with source to consumer indexing, shall lead to meaningful energy accounting. IoT based indexing/ addressing shall pave way for decision making through Artificial Intelligence.

On the other front, industries can sometimes face issues with power quality, which can impact their processes and result in loss of revenue. Some of these problems can be attributed to the utility, but many others often arise on the industry premise itself, due to reasons like overloaded circuits, generated harmonics or loads lowering power factor. To prevent such issues and address them quickly when they arise, industries should employ good power monitoring systems that identify inefficiencies, reduce peak demand, give notifications about maintenance needs and ensure the safety of people & systems. IoT based Industry 4.0 shall lead to new paradigm for Efficiency & Energy Monitoring System, predictive maintenance forecast and traceability. This will make room for enhanced energy efficiency and resource conservation in all sectors. This all shall lead to improved productivity, zero defects, lesser recalls eventually reducing resource requirement including shifts in manufacturing Industry. These measures have been envisaged to have demonstrated potential for energy saving for entire industries.

This digital transformation of companies can truly be completed when the workforce is skilled in the use of technologies, currently being used and aware of the technologies that will come into play in the future. A digitally skilled workforce that is equipped with the tools and the flexibility to work remotely will bring unprecedented levels of agility and resilience to power companies and utilities, even during times of unexpected disruption or crisis.

The government has succeeded, to a considerable extent, in creating an environment that inspires faith in investors and renewable-energy developers. Industries, on their part, should now look to improve energy efficiencies and adopt low-carbon technologies. Technologies must be explored to de-carbonize some of the "hard to abate" sectors. Many of the efforts needed to progress towards a greener, sustainable future involve treading new ground. The government and the industry will have to make some brave decisions and even take the occasional leap of faith to realize India's aspirations for sustainable development. Future generation shall have to emerge with in built energy consciousness, with temperament of energy innovations. This shall bring academia in the picture. Industry, Academia interface with government decisive steps shall lead to new market transformation and energy security to nation.

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Remaining steadfast and committed amidst the pandemic

As the backbone of national infrastructure, the Indian energy sector has demonstrated resilience and focus as it has adapted to the pandemic. The role of the energy sector is today more critical than ever. The knowledge economy – inclusive of white-collar enterprise and industry at large has pivoted to work-from-home operations and remote technologies, making reliable energy access more mission-critical than ever.

The sectoral response has been three-fold: Firstly, safeguarding the health of the large employee base that spans the entire energy value chain, giving them the tools and capabilities to operate in the new normal, and transitioning operations to the new digital milieu.

At Energy Efficiency Services Limited (EESL), a JV company of PSUs under the Ministry of Power, Government of India, the first priority is keeping its employees safe, which was spontaneously taken up by the employees themselves. The workforce came together and created an eighty member COVID taskforce, which ensured that no effort is spared to support employees who got infected, be it hospital beds, oxygen concentrators, medicines, etc. Coming out of the crisis the organization is stronger as each employee knows that the EESL family is standing behind him/her. The management chipped in with a health kit for the extended workforce (including drivers) and financial assistance in case of hospitalization. Two covid vaccination drives were held on 18th May 2021 & 13th August 2021 for all our employees and their dependents, who were urged to come out in large numbers to ensure their safety and well-being during the pandemic.

The company was swift to implement new digital workflows for most employees to ensure business continuity, even as the pandemic situation was evolving. All official meetings have been conducted online.

Similarly, important aspects governing EESL's growth and expansion, including RFPs, tenders, events, and MOU signings were performed virtually. On World Environment Day EESL ran a three-day online seminar on *"Energy Efficiency for Sustainability"* to discuss the merits of energy efficiency in meeting our climate goals. EESL organized roundtable discussion with organizations like the Indian Society of Heating, Refrigerating and Air Conditioning Engineers (ISHRAE) with Collaborative Labelling and Appliance Standards Program (CLASP) and topics like "Promoting Sustainability through Energy Efficiency in MSMEs". Furthermore, EESL's leadership actively took part in industrial forums and spoke about EESL's initiatives and efforts in mitigating climate action through energy efficiency in distinguished sectoral publications. Earth Day was also celebrated with great enthusiasm; where in celebratory and impactful conversation has been made via EESL's social media platform. EESL family was kept engaged through-out the difficult program and several well-being programs and yoga sessions were enthusiastically attended by the employees.

Automation has been a key part of EESL work-programme and its street lighting service kept more than 1600 towns safe by working without interruption as more than 1 Lac no. of control boxes provide connectivity to monitor the health and operation of these lights. Similarly, smart meters have proved to be boon for customers who could monitor and ration electricity consumption their energy consumption. DISCOMs where EESL is working were able to provide accurate bills on time, in contrast to other Discoms who took meter reading holiday and sent provisional bills.

With the rising appetite for energy efficient products, ease of purchase of consumers was managed with a listing on GEM portal and EESL's own e-commerce platform EESLmart.in. It hosts the entire range of EESL-led products, including Super-Efficient ACs, LED bulbs, brushless DC electric motor fans and energy efficient motors. With these products capable of transforming energy use in government offices, the pandemic has caused many job losses, EESL opened up its appliance program to create sales entrepreneurs who could utilize their network and passion to sell energy efficient appliances. EESL took on the responsibility to train 100 professionals in running the sales process as well as understanding the benefit of energy efficient appliances.

On the whole, the organisation's commitment to nation-building, energy security, sustainability and reliability is undeterred.

Rakesh K Rai
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Energy Sector & the Pandemic: Strategies for thriving in the new normal

Entering the second consecutive year of resiliently battling the COVID-19 pandemic, while the global economic engine has begun functioning again in the new normal, there has been a marked change in the way organizations operate. The fight against the pandemic is still ongoing, with the vaccine drive and efforts to regain the economic momentum. The energy sector, which played a central role in keeping the nation on its feet, has witnessed unprecedented changes. With the disruptions of supply chains and a drop in power demand, the energy sector has undergone some turbulent times.

Now, as we gradually recover from the brutal second wave of the pandemic, the energy sector must cull out operational inefficiencies. There is also a clear need for increased digitization of operations, which will greatly enhance the resilience during disruptions. The organizations that were ahead of the curve in adoption of digitalization have already reaped the benefits of greater inherent resilience. The imperative now for the energy sector is to sharpen its focus and pour in greater investment into digitalization, in a bid to maintain business continuity and maintain robust supply chains.

There is also a clear need to revamp the technological capabilities in the sector, with greater use of emerging technologies such as Artificial Intelligence, Machine Learning, Big Data and Blockchain. This will enable energy companies in better demand forecast, seamless remote operations, easy collections and swift redressal and troubleshooting. This can be particularly beneficial for utilities, as has been evinced by the resilience of utilities that relied on smart metering during lockdown periods.

This technological metamorphosis has to also extend to the workforce, with a rapid adoption of the new ways of working being essential. This will create a flexible and agile workforce, which can operate during periods of disruptions. For this, the sector has to reduce its dependance on human interventions, and instead bolster each touchpoint with technology. It has to stay abreast of the mutable nature of technology, as this will be a key cog for its recovery and resurgence, post the pandemic.

The sector will have to proactively root out the inefficiencies that were laid bare during the pandemic. The focus also has to be honed on hygiene, safety and business continuity, for the employees and throughout the supply chain. Energy security is at the core of any thriving economy, especially during crises and thus needs to be ensured with diligence and alacrity. We need to create digitalized, secure and resilient energy systems, which can function seamlessly during turbulent periods.

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COVID & the Climate Emergency: How the Energy Sector Can Thrive in the New Normal

The COVID-19 pandemic has now entered its second year. As the global economy learns to cope, with varying degrees of success in various sectors and countries, there has been a marked change in the way verticals operate. The energy sector, which plays a central role in keeping the engines of the economy humming, has seen unprecedented change. With disruptions in supply chains and a drop in power demand, the energy sector has had to rise to the occasion in multiple ways.

However, there is still a lot of work to be done. COVID is not going away in a hurry and, even when it does, it will have altered the way people live, work and play. The pandemic has been accompanied this year by dramatic climate events that have been, in some ways, no less unprecedented than COVID. These have brought home the fact humanity is facing a climate emergency here and now. Climate action brooks no delay. Initiatives in related areas that have been planned or have been under consideration have to addressed on a war-footing. The upcoming COP 26 global summit in November this year is expected to take discuss important aspects in this regard.

Between themselves, COVID-19 and global warming have had an impact on how energy is being produced and consumed. The world is transitioning to cleaner energy and so is India. The Indian government is fully committed to this goal and has taken the lead in energy efficiency.

Widespread adoption of renewables are the next step in India's progression towards a clean, green, and secure energy future. There have been advances in this regard, but awareness among public remains limited. Realisation must dawn among them that there is no alternative to clean, green and low carbon sources of energy. The climate emergency is proof positive of this. It impacts not only lives but also livelihoods. Transition to clean energy can provide an impetus to the economy by bringing about significant improvements in livelihoods as well as the quality of life.

However, little can be achieved if there is insufficient awareness in the stakeholders — laypersons, industry, and policymakers, especially in the states — about the crying need to give primacy to sustainability and adopt clean energy at the earliest. Therefore, what is imperative now is the adoption and implementation of communication programmes that will increase information-based awareness. Effective engagement and outreach are essential for raising awareness that will lead to meaningful action on the adoption of clean energy and sustainable work habits and lifestyles. Communication will play a big role in increasing energy literacy.

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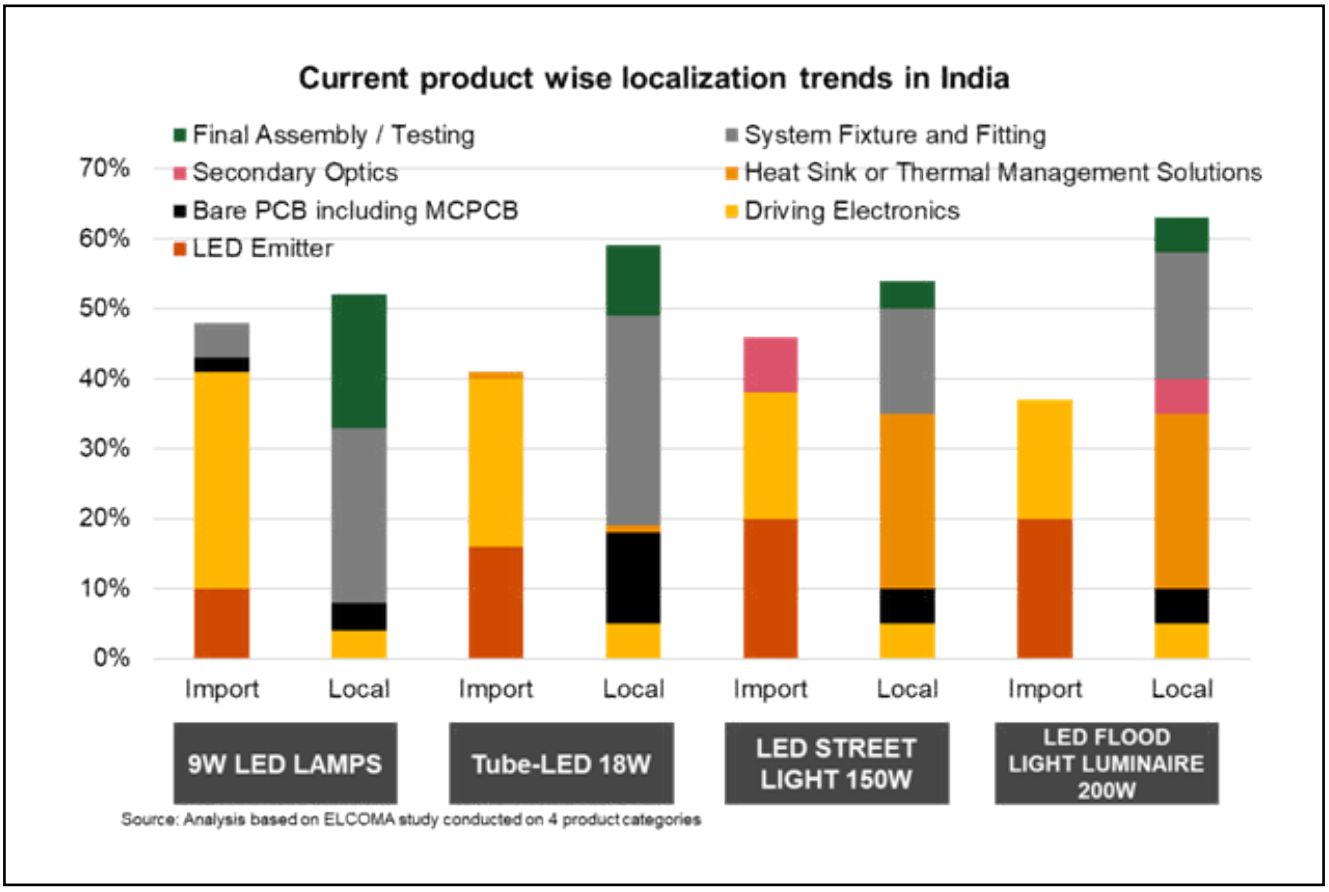
Navigating the PLI Scheme for LED Manufacturing

India is a global economic powerhouse and one of the world's largest LED consumer markets. Though predominantly, the domestic manufacturing of LED products has been oriented towards 'final assembly/testing' and 'system fixture and fitting', with the majority of the core manufacturing being outsourced.

LED localization trends in India



At the backdrop of COVID-19 and emerging geopolitical relations, the LED supply chains have wide diversification potential, presenting an emerging domestic value creation opportunity for India. The Production-Linked Incentive (PLI) scheme has been launched with the specific objective of developing domestic manufacturing capabilities in the next-generation infrastructure, expanding the capacity to cater to the emerging export markets, and narrowing the trade deficit by USD 55 billion over the 5 years of the scheme implementation. For white goods, with incentives of USD 855 million , the GoI is aiming to develop domestic production capabilities of more than USD 17 billion.

The scheme defines LED products as LED downlights, tubular and battens, street lights, and other luminaires and assigns a higher priority to components that are deeper in the value chain, i.e., those that are not a product of general assembly, and components or sub-assemblies that are not manufactured in India at scale. Further, since the overall objective of the scheme is to boost domestic manufacturing, the manufacturers have to specifically demonstrate their plans to increase domestic manufacturing and have to specify domestic value addition (%) and targeted exports (INR Cr.) as part of the initial applications.

A key feature of the scheme is outcome-based and result-oriented incentives, i.e., a manufacturer can only avail of the scheme's incentives, if they achieve the minimum investments and production targets as specified under the scheme. Since the scheme is fund limited, the incentives will be capped at the net incremental sale of eligible products up to 6X of the cumulative threshold investment in the previous year. This essentially means that the sales value on which the incentive is calculated will be capped at 6 times of the investment in the previous year, i.e., if a manufacturer commits an investment of INR 200 Cr in the first year and makes a sale of INR 1,500 Cr in the corresponding year, their PLI will be calculated at a maximum value of INR 1,200 Cr.

KEY CONSIDERATIONS FOR NAVIGATING THE PLI SCHEME

From applying for the scheme to implementation, we have highlighted four broad steps that should be vital for the manufacturers:

1. Initial Application: Deadline 15 September

Manufacturers have to demonstrate their capability to not only manufacture but to create domestic value through manufacturing. Some key metrics and documents under focus will be – yearly plan for manufacturing, domestic value addition and exports, employment generation metrics, detailed manufacturing process notes and detailed manufacturing flow charts with inputs required in each stage of the process flow chart and the output at each stage of manufacturing.

2. DPIIT/PMA coordination

Post the application process, DPIIT and its assigned Project Management Agency (PMA) and Empowered Group of Secretaries (EGoS) may invite bidders for a presentation and seek clarifications on the submitted application.

3. Scheme integration and implementation

Once the incentives are allocated under the scheme, the manufacturers should explore enhancing their business and financial strategy by considering threshold investments, sales and incentives. Also, a key consideration should be given to developing product and supply chain strategies to meet long-term eligibility and compliance with the scheme.

4. Filing disbursement applications and DPIIT follow-ups

To access the incentives, manufacturers will have to submit disbursement applications and strengthen coordination with DPIIT. This will need the internal firm processes of auditing, data collection, and approval to be streamlined. Further, a firm-wide task force could be set up with the responsibilities of coordination and process monitoring.

Energy trends from India & across the globe

- **Renewable energy thrives in India, despite the pandemic**

Solar and wind power have made significant inroads into India's energy mix. While the shutdown severely impacted economic activity and caused electricity demand to fall by 28% during the lockdown, there were several positive market developments that signalled the attractiveness of the RE sector. Additionally, Indian RE companies raised billions of dollars of debt funding from overseas. As India now chases higher RE targets, there are three key challenges that must be solved. The first is grid integration. Solar-wind hybrids and the new market platforms can help until, and even after, grid-scale storage becomes affordable. The second challenge comes from overhangs of unsold capacity. Dynamic tariffs which share the benefit of future declines with DISCOMs could be the answer. The third is raising the huge amount of capital to meet the targets. Tapping additional sources of capital is imperative, and mechanisms such as subsidised credit enhancement that open up the domestic bond market to RE can prove to be invaluable.

- **An unprecedented global health and economic crisis**

The energy sector has been severely affected by this crisis, which has slowed transport, trade and economic activity across the globe. The analysis showed an average 25% decline in energy demand per week and countries in partial lockdown an average 18% decline. The implications of the pandemic for energy systems and clean energy transitions are still evolving but three areas in particular stand out:

  - Energy security remains a cornerstone of our economies especially during turbulent times
  - Electricity security and resilient energy systems are more indispensable than ever for modern societies
  - Clean energy transitions must be at the centre of economic recovery and stimulus plans

- **COVID-19 intensifies the urgency to expand sustainable energy solutions worldwide**

To meet the Sustainable Development Goals (SDGs) targets by 2030, countries must safeguard the gains already attained and accelerate efforts to achieve affordable, reliable, sustainable and modern energy for all. Policymakers and development partners with global, regional, and country-level data need to make informed decisions and identify priorities for a sustainable recovery from COVID-19.

- **COVID-19: Impact analysis and recommendations for power sector operation**

The demand of electricity has been reduced significantly due to the COVID-19 pandemic. Hence, there is a significant increase in residential load demand, while there is a substantial decrease in commercial and industrial loads. This situation creates new challenges in the technical and financial activities of the power sector and hence most of the utilities around the world initiated a disaster management plan to tackle this ongoing challenges/threats. Recommendations from the plan are as follows:

Energy efficiency measures: Besides an immense interest in renewable energy investments, utilities and policymakers need to put some considerations on nationwide energy efficiency programmes. Some energy efficiency measures such as fixing the cooling and heating equipment standards, demand-side management programmes, promoting green buildings, promoting energy star appliances etc. can be undertaken. Deploying energy efficiency measures in the commercial and industrial sectors would make a huge difference in the way energy is utilised now.

Digitalisation of the power and energy sector: From the power and energy sector perspective, a transformation is occurring across the energy value chain, starting from the electricity generation, through transmission and distribution, all the way to the end-use electricity supply for residential, commercial and industrial consumers. The transformation can be briefly portrayed using three D's - Digitalization, Decarbonization and Decentralization. The digital solutions can facilitate the society with reduced GHG emissions, new job opportunities and value for consumers. Therefore, national policymakers should incorporate the digital transformation of the energy sector in their respective country policies to boost up the restructuring of the power and energy sector.

Smart Grid: Smart grid technology is the integration and smart communication between generation system, transmission line, substation, transformers and other systems for reliable service to the consumers. The smart grid is a self-sufficient network system which controls, monitor and analysis complete energy supply system. A smart grid system transmits electricity more efficiently, restores power disturbances quickly and reduces operation and management costs. The complete electric system should adopt smart grid technology for better security of the system and better integration between customer and utility sector. This technology would also lead to better utilisation of renewable energy sources. Smart grid recognises the blessings of the blending of the digitalisation of the sector, distributed integration of renewable energy resources, presence of energy market and implementation of microgrid infrastructures. The exposed vulnerabilities of the energy sector can be well addressed by fully utilising the capabilities of Smart Grid in the respective countries.

Demand-side load management: Demand side load management strategy reduces investment cost in the power generation and transmission sector in order to meet the peak load demand. Demand-side management also allows grid operators to balance intermittent electricity generation from solar and wind plants, which can give a boost to renewable energy sources. National investment in generation and transmission sector can be well deferred to a later time due to well-planned demand-side load management programmes.