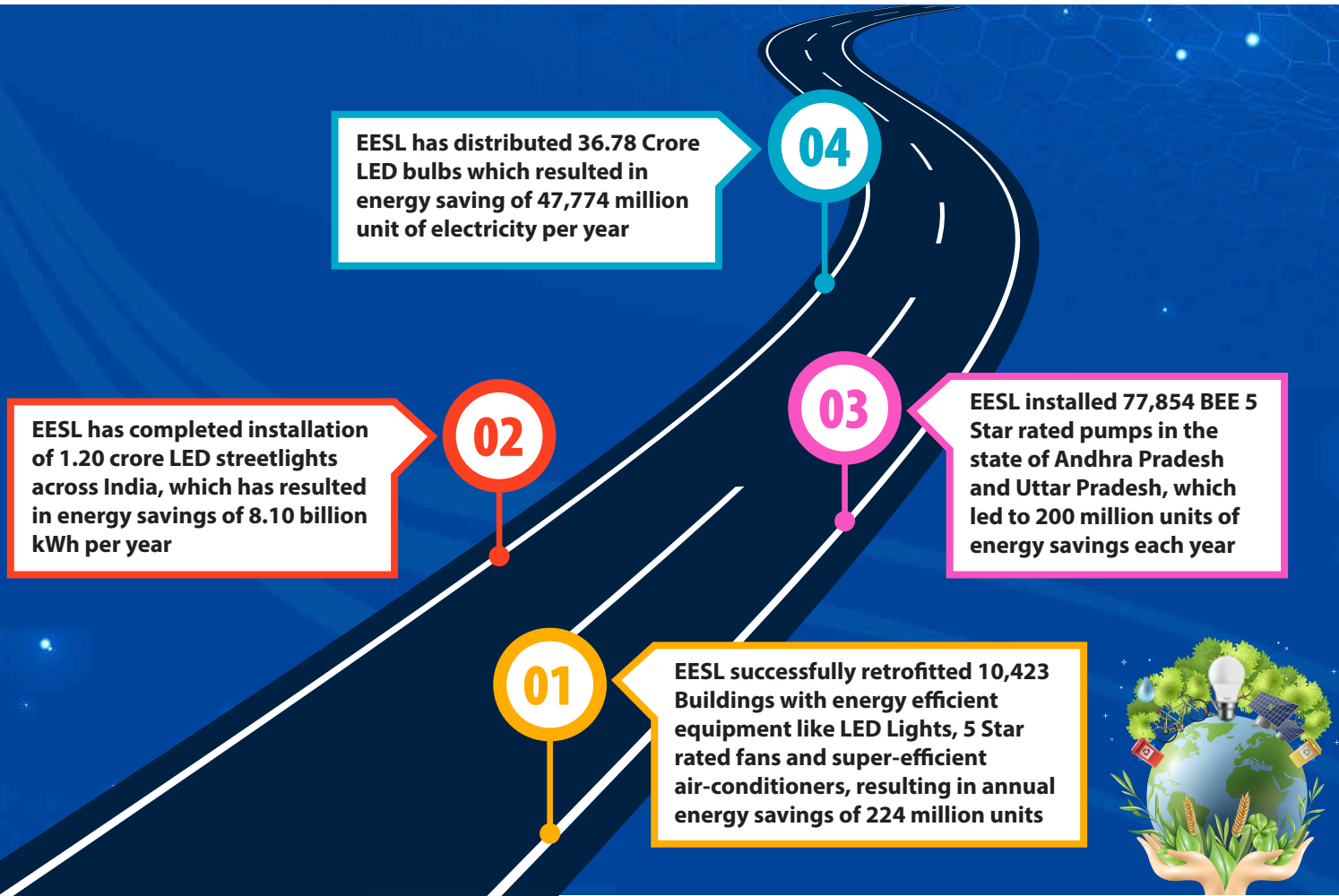


INNOVATING ENERGY

Energy efficiency milestones achieved this year and their impact <<<



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Chief General Manager,
Head (Sales & CCPR)
Energy Efficiency Services Limited



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Director
Bureau Of Energy Efficiency

IN FOCUS

ENERGY TRENDS FROM INDIA AND ACROSS THE GLOBE



Editor's Note

Animesh Mishra

Chief General Manager, Head (Sales & CCPR)
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Dear reader,

India's climate commitments have been lauded globally, as despite not being a major historical polluter, we have set highly ambitious targets for emission reduction and achieving net zero. Our honourable Prime Minister has also rightly underpinned the importance of climate financing in achieving these goals. The five-point agenda, outlined by him will serve as India's roadmap for building a sustainable & clean energy future for all of us.

India's climate action has been aided primarily by the building climate consciousness, and the rapidly scaling market for clean energy alternatives. This metamorphosis was bolstered significantly by the ramping up of the nation's energy efficiency across sectors. With the rise in power demand, austerity of energy use has become crucial towards achieving the aforementioned climate goals. The potential of energy efficiency is truly limitless, and a 2017 IEA report, says that energy efficiency gains have helped households in major economies avoid nearly \$300 billion in additional spending on energy, with corresponding fall in energy intensity and energy-related greenhouse gas emissions, is a testament to that. To that effect, EESL has taken up the mantle of reducing India's power exigency, across a host of sectors. Initiatives such as UJALA, SLNP, Smart Metering, E-mobility and EVCI, along with Decentralised Solar have had immense ecological, economic and social impact. In fact, EESL has been responsible for the creation of a thriving LED market in India, through its highly successful UJALA scheme. The impact of its initiatives has been largely agnostic of geography, with tremendous impact in various other countries, including Maldives, Bangladesh, Malaysia and Saudi Arabia among others.

This edition of the newsletter, themed 'Energy Efficiency milestones achieved this year and their impact' delves into the major energy efficiency wins in the year gone by and deconstructs their success.

In 'COP26 And India: How Digitalization Could Be the Gamechanger' traces the correlation between India's climate ambitions and digitalization of its power system. 'Using energy efficiency to augment India's climate actions' builds the case for energy efficiency to become a larger part of the climate change discourse. We then look towards EESL's rising prominence and its role as global energy efficiency pioneer in 'With its energy efficiency initiatives, EESL is an Indian change driver to the world!' Finally, the article 'Embracing energy efficiency in India: What's needed?' charts out the roadmap for taking India's energy efficiency ecosystem into the next gear.

We are at a crucible of our climate change efforts, wherein the concerted efforts of all stake holders have borne fruit. What we need now is concerted and collaborative efforts from all pan industry organisations, investors, research institutions and the government towards increasing the adoption of energy efficiency.



Cop26 and India: How digitalization could be the gamechanger

Anil Rawal

Chief Executive Officer
IntelliSmart

The world nations collectively acknowledged the tell-tale signs of the climate change and came together to formulate and commit a global action with concrete deliverables in 2015 under the Paris Climate Change agreement. The agreement targeted various deliverables including a committed effort to keep the global average temperature increase well below 2 degrees Celsius and to pursue efforts to limit it to 1.5 degree Celsius above pre-industrial levels. However, the efforts have not been seeing much of the success since then. The two key reasons of the less than expected success were the lack of the technology transfer from the western world and the failure of the developed world to deliver on its decade old promise of mobilizing at least US \$100 billion every year from 2020. While some of the countries including India have taken a conscious decision to pursue the self-driven path of sustainability and ecological balance, the larger world has slowly been becoming more and more vulnerable to the human driven catastrophic events related to climate change. The threat of submergence looms large on about 570 cities of the world by 2050 and out of these 12 cities may belong to India alone.

This is in this perspective that the last week COP26 climate change summit in Glasgow and its musings become of the critical importance to the human race. Countries reiterated their commitments to the Paris Climate change agreement and many of the countries improved over their previous commitments. India stood out in terms of undertaking various goals some of which were overdue and some other being very inspiring and exemplary. India, despite having 17% population, contributes only 5% to the global emission. This point was profoundly brought out by the Prime Minister while presenting the world with 'Panchamrit' – the five solutions. The Panchamrit includes:

- By 2070, India will achieve the target of net zero emissions.
- India will reach its non-fossil energy capacity to 500 GW by 2030.
- India will meet 50 percent of its energy requirements from renewable energy by 2030.
- The country's emissions intensity, or emissions per unit GDP, will be reduced by at least 45 per cent by the year 2030 from the 2005 levels. In its existing target, India had promised to reduce its emissions intensity by 33 to 35 per cent by that date.
- By 2030, India will reduce the carbon intensity of its economy to less than 45 percent.

A deeper look into 'Panchamrit' would indicate that all the success of these five goals would impinge on implementation blue print of the first one which is about achieving the target of net zero emissions by the year 2070. The Net zero basically refers to equation of equilibrium between the greenhouse gases emitted into the ecosystem and the greenhouse gases being taken out of the ecosystem. For a country to achieve Net Zero emissions, it needs to evaluate the components which are adding these gases and balance out with the components which would suck it out of the air.

In case of India the fossil fuel based power generation, which is about 210 GW of coal based capacity and about 65 more GW under various stages of construction is one of the key contributor to the greenhouse gases emission along with large fossil fuel based vehicular load. On the cancelling side India's strategic and conscious drive towards decarbonization through renewables augurs well to the cause. India has shown at least a clear commitment to transition from fossil fuel to green energy. Our current target is 225 GW renewables by 2022 with next key milestone being the installed capacity to generate 450GW by 2030. This target of 450 GW stands now enhanced to 500 GW under renewed COP 26 targets.

The Central Electricity Authority's projection indicated that the country would need to have the installed capacity of about 1130 GW by 2030. Further, Centre for Science and Environment (CSE) has done a projection for the country's energy mix for 2030 which shows that out of required capacity of 1130 GW by 2030, the country will need to have solar energy installed capacity of 280GW and wind energy installed capacity of 140GW. The rest of the energy needs will come from nuclear. Similarly the CEEW also estimated that solar capacity shall be ramped to 5,630GW by 2070 and the wind capacity shall be 792GW by 2070. India must start swiftly moving to electric cars and to biofuels for heavier vehicles for meeting Glasgow targets. Similarly, it is expected that industry may have to fast drive the hydrogen as reliant fuel.

Heavier dependence on renewables, increased penetration of green energy in the grid and mass adoption of EVs cast a significant unbalancing threat to the grid. As we stand today, 70% of energy need in the country is met from fossil fuel and the renewables other than hydro contribute to less than double digit share in energy sense. Meeting a commitment of 50% of energy from renewables would have significant grid balancing concerns on account of energy variability these sources bring to the grid, particularly in view of the fact that share of hydro and gas based energy has been dwindling in recent times. Further, more penetration of EVs would enhance of local grid imbalances as our distribution network at last mile is certainly not in the best of the shapes.

The meticulous demand side management of the grid based on granular demand side data and building the digitalization components of the grid for having universal smart grid has to be the imperative requirement for meeting such steep commitments on decarbonization. Country has been positioning on the digital transformation of the grid for some time now. The biggest single commitment towards digitalization comes from the drive for smart metering and smart grid. India has very timely come out with Revamped Distribution Sector Scheme (RDSS) which has placed a financial commitment of more than 3 lac crores from centre government towards various digitalization initiatives. Country has already installed about 3 million smart meters and targets to install about 100 million meters by 2023 and complete transitioning to smart metering by 2025 having 250 million smart meters. The granular data coming from smart meters and a deeper data analytics along with Artificial Intelligence (AI) tools shall provide the strong means in the hands of the grid operators to manage the demand side of the energy. The AI based intervention in the grid can help the management of energy peaks in the wake of variability issues of renewables and also shall solve the grid balancing requirements.

India's renewed commitment under COP 26 shall trigger the massive wave of fast forward digitalization in the Indian grid, which provides a significant revenue upside for the Indian power sector. The digitalization process would also help plugging the ever increasing losses of Indian Discoms leading to expected savings of about INR 10 lac crores and also have a massive further potential upside of revenue through value added services based on Big Data Analytics and AI initiatives.



Using energy efficiency to augment India's climate actions

Pravin Abraham

Director
Manikaran Power Limited

At the recently concluded COP26 global climate summit in Glasgow, India made several significant commitments towards mitigating further climate change. These included the targets of achieving net-zero emissions by 2070, reducing carbon emissions intensity to 45 percent of current levels and reducing carbon emissions by One billion tonnes, by 2030 . All these targets are closely correlated, and energy efficiency is one of the very important ways in which progress towards them can be augmented and accelerated. Energy efficiency can reduce both the amount of energy needed as well as the capacity and cost of low-carbon energy systems that are installed to meet the energy demand. Energy efficiency can be pursued in almost every industry and sector. It can be achieved, for instance, through the digitalization of real estate and construction sectors and through electric mobility and emission standards in the transportation sector.

According to data published by the Ministry of Statistics, Planning and Implementation in 2016, residential and commercial structures accounted for nearly one-third of the total electricity consumption in India. As urbanization increases, so will the demand for energy. NITI Aayog estimates that the energy needs of India's buildings in the year 2040 will exceed the 2012 levels by more than three times. If current trends are any indication, India could face high energy costs and worsening air pollution in the coming decades unless appropriate steps are taken today. Introducing policies and programs for improving the energy efficiency of buildings will be a step in the right direction. Net-zero energy buildings, which have very high performance, should be encouraged, as they reduce energy demand by incorporating energy-efficient technologies and using renewable energy to meet incremental energy needs.

Lighting can account for up to 30-40 percent of the total energy consumption in cities. One of the simplest ways of minimizing energy consumption is therefore to use energy-efficient appliances such as LED tube-lights, bulbs, and lamps. Scaling up the use of energy-efficient fans, air conditioners and lightings can significantly lower the amount of electricity required, which, in turn, will lessen the burning of fossil fuels, ultimately reducing the emission of greenhouse gases and other noxious pollutants. It makes good sense to enforce green building standards and retrofitting measures that reduce energy consumption within buildings. Similarly, improvements in the energy efficiency of industrial operations can lead to a huge reduction in emissions.

For long, energy efficiency has been an afterthought or an add-on for most industries. But times have changed now, and energy efficiency needs to be at the very heart of every human activity that requires power. It is time to fully appreciate the fact that energy saved is energy gained, and we should work towards it.

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<https://www.wri.org/insights/indias-move-make-buildings-efficient>

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With its energy efficiency initiatives, EESL is an Indian change driver to the world

Arun Kumar Mishra

Chief Executive Officer

Energy Efficiency Services Limited

The COP26 summit concluded with a fresh hope for a global shift towards sustainability. The onus is now on the nations to walk the talk and meet the ambitious goals set during the summit. India yet again emerged as a pioneer in climate action, with its visionary five-point agenda. With the focus now sharpening on reduction of emission intensity, energy efficiency has become even more significant than ever before. With its trifecta of benefits – emission reduction, energy savings and peak power demand avoidance, energy efficiency is now 'fuel' of the future.

IEA estimates state that energy efficiency can contribute up to 49% of the energy-related CO2 emission reductions that are needed to limit global temperature increases over the next several decades. Over the last decade, energy efficiency has emerged as a potent tool in the arsenal of governments and organisations. It has enhanced energy security and has been leading the charge in global climate change mitigation. The nations around the world have significant energy efficiency improvement potential, especially for their industries. Energy efficiency is a viable tool to embark on a sustainable development path and makes considerable business and ecological sense for industries. EESL took up the mantle of steering India's energy transition more than a decade ago. Since then, it has brought about a transformation in India's energy use patterns, by permeating energy efficiency across sectors – buildings, transportation, industry, or cities. One of the tailwinds of EESL's success has been the replicability of its programmes in other markets and their ability to scale rapidly, across geographies.

There have been many success stories for EESL domestically, be it creating a new market for LEDs through UJALA, installation of 1 crore LED streetlights under SLNP or beginning a complete reform of India's power sector through smart metering. EESL's Street Light National Programme (SNLP) has installed over 1.2 crore smart streetlights in India, since its inception five years ago, making it the world's largest street lighting programme. Along with mitigating 5.68 million tons of CO2 emissions, the initiative has also facilitated 8247.4 MUs of energy savings annually.

These initiatives of EESL have eliminated steep upfront payments for the adoption of energy efficient technologies, which has made them easily scalable and attractive. This business model can unlock demand in sectors where none has existed before, driving large scale initiatives and creating a scrutinization of markets for transformative, future-ready solutions.

EESL's success and impact has been agnostic of geographies, spanning across nations such as Maldives, Middle East, the UK, Thailand and Bangladesh among others. EESL has emerged as a major sustainability and energy efficiency player, globally. The time is now for energy efficiency to gain global spotlight and for nations to integrate it across sectors, with alacrity, so that a deeper impact is felt. EESL's endeavours and success can act as roadmap that can be emulated globally, for ramping up the adoption of energy efficiency.



Embracing energy efficiency in India: What's needed?

Milind Deore

Director

Bureau Of Energy Efficiency

Energy efficiency is now being increasingly acknowledged as the game changer in keeping the burgeoning energy demand in check. Efficiency of energy use through innovative interventions is now more pivotal than ever before. There has also been rise in relevance of energy efficiency in the past decade, with more and more sectors focusing on streamlining their energy use. From transportation to lighting and industries, energy efficiency has permeated a host of sectors. With the onset of LEDs and energy efficient appliances, energy efficiency has also firmly entrenched itself in our households.

A 2021 BEE report on the Impact of Energy Efficiency Measures in India says that the adoption of energy efficiency programmes has led to the overall energy savings of 28.06 Mtoe (million Ton of oil equivalent) for the year 2019-20. These energy savings translated into monetary savings of worth INR 115,702 crores. Meanwhile, the equivalent reduction in CO₂ emissions was around 177.6 million Tonnes annually.

The myriad of benefits of energy efficiency are clear. Globally, efficiency improvements made since 2000 have prevented 13% additional energy use in 2019. It has also prevented 12% more greenhouse gas emissions and 20% more fossil fuel imports, including over USD 30 billion (United States dollars) in avoided oil imports. However, there still remains a significant untapped potential for energy efficiency in India, especially in industrial sector. Energy efficiency represents more than 40% of the emissions abatement needed by 2040, according to the IEA Sustainable Development Scenario.

The foundations of India's energy efficiency story were laid by the Bureau of Energy Efficiency (BEE), when it launched efficiency policies for residential appliances in 2006. The policies were aimed at reducing the energy intensity of the economy. Over the years, this policy has undergone multiple revisions, in a bid to stay abreast of the changing energy landscape. BEE has also been working closely with industries to reduce their energy use. Energy Efficiency Services Limited has played an important role of market enabler for transforming landscape of energy efficient and clean technologies.

However, there is a need to fast track the adoption of energy efficiency in India, even further. Herein, solutions such as affordable pricing, bulk procurement, financial instruments such as capital subsidy and interest-subvention scheme of central and state governments can further accelerate deployment of energy efficient technologies.

Secondly, for industries especially, the focus must be sharpened on R&D to create innovative, low-cost, and indigenous energy efficient technologies. There are already an array of energy conservation measures available, which can transform the entire value chain for the industries. Blending of energy conservation measures and integration of clean and energy efficient technologies enhance the viability and profitability of industries.

Thirdly, we need to motivate and raise awareness around the various environmental and economic benefits offered by energy efficient technologies, in a bid to stimulate their adoption by both industrial and individual users.

https://beeindia.gov.in/sites/default/files/BEE_Final%20Report_Website%20version_0.pdf

<https://timesofindia.indiatimes.com/blogs/voices/energy-efficiency-carbon-financing-are-integral-to-the-global-climate-action-agenda/>

<https://www.iea.org/commentaries/how-energy-efficiency-will-power-net-zero-climate-goals>

Energy trends from India and across the globe

- **COP-26 and energy transition: An outlook on India's stance**

COP-26 can be considered as one of the most anticipated and the biggest international summits so far in the history of climate action. The COP-26 Energy Transition Council (ETC) reiterated the fact that an immediate and just transition to clean energy holds great significance in order to meet the Paris Agreement goals. In recent years, India has become a pioneer in climate protection and is one of the few countries to have performed exceptionally on the mitigation goals of NDCs. Hon'ble Prime Minister, Shri Narendra Modi, in his speech at COP-26 highlighted how India expects developed nations to provide climate finance of \$1 trillion, while also stating the nation's five-point resolution. India currently ranks 4th worldwide in installed renewable energy capacity. Additionally, India has successfully produced energy from non-fossil fuel sources by more than 25% in the last 7 years thereby reaching 40% of the country's energy mix.

- **This is how we can achieve net zero by 2050, according to the UN**

United Nations launched a roadmap for the clean energy transition during the COP-26 climate change conference earlier this month. The SDG7 Global Roadmap outlines how the world can move to clean energy by 2030, as part of the journey to reducing greenhouse gas emissions to net zero by 2050. Four years from now – by 2025 – the goal is that 500 million more people will have access to electricity, while 1 billion more people will be able to access clean cooking solutions. To achieve this, \$35 billion and \$25 billion needs to be invested into improving access to electricity and clean cooking, respectively. By 2025, the roadmap also calls for subsidies for fossil fuel consumption to be re-directed towards renewable energy and energy efficiency. "These will help ensure an inclusive green recovery by investing in poverty reduction, health, education and social protection," says the UN.

- **Global energy efficiency progress is recovering – but not quickly enough to meet international climate goals**

The IEA's latest global assessment of market and policy trends in energy efficiency highlights the urgent need for stronger implementation of clean energy policies – with energy efficiency at their core – in order to reach international climate goals. The report comes shortly after the end of the COP-26 Climate Change Conference in Glasgow, whose final statement specifically called for the rapid scaling up of energy efficiency measures, recognising their key role in decarbonising energy systems. The report notes that governments have scaled up existing, employment-intensive efficiency programmes, but it also highlights that substantial potential for job creation remains untapped.

- **Why energy efficiency needs your attention**

Your home, office building and shopping centers are lethal influencers of climate change. These buildings are responsible for about 40% of global energy consumption and about one-third of global GHG emissions. The 2020 Global Status Report for Buildings and Construction paper, published by the GlobalABC, reported that while global building energy consumption remained steady year on year, energy-related CO₂ emissions increased to 9.95 GtCO₂ in 2019. This requires incremental energy efficiency investment in buildings, and the share of renewable energy in global buildings. Adding its voice to the importance of energy efficiency, the IEA's latest global assessment of the EE market and policy trends highlights the urgent need for more robust implementation of clean energy policies. The review places energy efficiency at its core to reach international climate goals.

- **5G technology is also more energy-efficient**

A recent report from Ericsson highlights that 5G and IoT could yield carbon emissions savings of as much as 15%. At COP-26, along with targets to achieve net zero carbon by 2070, and reduce emissions intensity by 45 per cent, India has set the ambitious target to reduce total projected carbon emissions by 1 billion tonnes (BT) by 2030. 5G, and the technologies it enables, will be critical tools that will help nations effectively address the climate challenges of our time. By enabling the deployment of sophisticated AI and IoT networks at scale, 5G will make electrical grids more efficient, drive significant reduction in greenhouse emissions, as well as enable and optimize the integration of greater amounts of renewable energy.

Diwali Celebration at EESL Corporate Office

Rangoli Competition



Diya/Lantern Making Competition for Employees' Children



Shreyashree Satapathy
Daughter of Rashmi Ranjan Satapathy



EESL launches DSM programme in partnership with four DISCOMs in the state of Odisha

EESL along with Institute for Sustainable Communities (ISC) launched a utility-based demand side management (DSM) Programme for the DISCOMs in Odisha. A total investment of Rs.441.66 Crore has been planned in the state in a phased manner. The DSM programme aims to accelerate adoption of energy efficient technologies to reduce energy consumption as well as GHG emissions.

- The utility-based DSM Project will generate financial savings of Rs. 12-13 Crores for the DISCOMs of Odisha apart from associated incentives. Further, it will lead to financial savings of Rs. 73.57 Crore for the consumers of DISCOMs.
- EESL's energy efficient appliances like Super-efficient ACs, energy efficient 5-star BLDC fans, LED lights and bulbs and energy efficient motors will all be available at 20-30% lesser prices than their typical market in the state.
- Through DSM, Odisha will be able to address the rising power supply costs, energy subsidies, climate change, environmental degradation, and energy security concerns.



SEAC



NMRP



UJALA Tubelight



UJALA Bulb



BLDC Fan



For more information, please contact us



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