

INNOVATING ENERGY

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Nurturing the nature for a sustainable future



INSIDE STORY



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Editor's Note



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Energy-Efficient Cooling: The Crossroads of India's Development and Climate Futures



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The Potential and the Challenges of Indian MSMEs, and how UNIDO is helping them on their Sustainability Journey



Saurabh Kumar
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EESL Group

Ratcheting the Penetration of Energy & Environment Friendly Initiatives: EESL Success Story



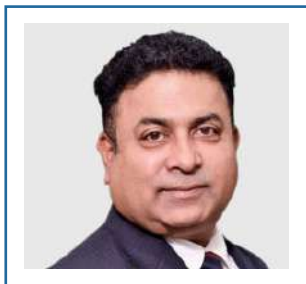
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Promise of Energy Efficiency for Sustainability



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Significance of Sustainable Cooling in Protecting Our Environment



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Editor's Note

Dear Reader,

We live in a dynamic and mutable world. With increased urbanization and industrialization, the world as we know it, has undergone a rapid transformation. This shift however, has also damaged our ecosystems. Rising emissions and indiscriminate use of resources has led to a deterioration of our fragile ecosystem.

However, there has been a paradigm shift globally, as ecological preservation and climate change have entered into the global consciousness and discourse. This edition of our newsletter, commemorating the World Environment Day, delves into the key imperative of ecological restoration. Themed 'Nurturing the nature for a sustainable future', the newsletter explores some of the pathways to sustainable development.

In "The potential and the challenges of Indian MSMEs, and how UNIDO is helping them on their sustainability journey: Work done by United Nations Industrial Development Organization (UNIDO) in India", we take a look at sustainability from the lens of MSMEs. We also take a deep dive

into UNIDO's efforts in enhancing manufacturing for the future and promoting sustainability in various spheres of the manufacturing ecosystem in India. "Significance of Sustainable Cooling in protecting our Environment" emphasizes on the need for sustainability in our cooling sector, and explores how energy efficiency can reduce emissions from our cooling systems. The article also highlights some potential solutions that can mitigate the ecological impact of cooling, at an individual and institutional level. "Ratcheting the penetration of energy & environment friendly initiatives: EESL success story" traces some of the key clean energy and energy efficiency interventions from EESL and shines the spotlight on their considerable ecological impact.

This year's World Environment Day theme of 'Ecosystem Restoration' takes cognizance of the need for reviving our environment. Mitigation and reduction, while important, is no longer enough. Active restoration of our natural ecosystems is now the imperative, at an individual, organizational, industrial, as well as governmental level.



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Energy-Efficient Cooling: The Crossroads of India's Development and Climate Futures

Many recent years, including 2020, have been the warmest in India since recordkeeping began in 1901. Cooling is being increasingly regarded as a development need. New sales will increase the stock-in-use of room ACs 10X in 20 years. Whilst this will strengthen SDGs such as good health and decent work, it will seriously compromise the SDG of climate action. Per one estimate, India's demand for comfort cooling will emit 25% of yearly global GHG emissions by 2050. Besides, the heat divide between the cool haves and the hot have-nots will weaken the SDG of reduced inequalities. But energy-efficient cooling can minimise the trade-offs between these SDGs.

India has a robust policy infrastructure, comprising MEPS, S&L, and ECBC, that intersects with many aspects of energy-efficient cooling. This makes it ripe for pioneering strong future actions. The globally recognised India Cooling Action Plan recommends a combination of policy, technology, and market interventions centred around energy efficiency to make India's cooling future more sustainable.

Considering the growing importance and high energy intensities of room ACs, it is critical to put into effect a long-term energy efficiency roadmap for them (more impressive than the incremental improvements observed historically), which truly represents industry capabilities and the best

available technology. Alongside, consumer awareness campaigns and innovative market instruments should drive more uptake of 5-star room ACs, which comprise less than 20% of current sales. But India's cooling story cannot be limited to room ACs. Akin to renewables targets, the government should set ambitious energy efficiency targets, e.g. to make 70% of India's 2040 fan stock-in-use super energy-efficient. Inspired by India's LED success story, this can be achieved by aggressive fan retrofitting and replacement programmes and concerted market enablement. In another example, upcoming public buildings should demonstrate the techno-economic effectiveness of district cooling and help unleash its full potential.

The addition of 290 million people to India's urban population between now and 2040 (same as adding a city the size of Los Angeles every year!) will lead to rapid growth in its building stock, and rising incomes will drive the ownership of many cooling appliances. This growth presents more development and GHG mitigation opportunities for sustainable cooling in India than for any other country. Can India avail this critical window of opportunity to become global champion of energy-efficient cooling to meet its development needs whilst making a stronger NDC to preserve and restore our ecosystems?



René Van Berkel

**UNIDO Representative
Regional Office in India**

The Potential and the Challenges of Indian MSMEs, and how UNIDO is helping them on their Sustainability Journey

Micro, small, and medium enterprises, or MSMEs, are widely regarded as the backbone of the Indian economy. There are approximately 63 million MSMEs in India and they contribute almost 29% of India's GDP through national and international trade, besides creating over 110 million jobs. The Indian government and its agencies are making efforts to facilitate sustainable manufacturing practices, technology for MSME clusters, enabling units to "green" their production processes and products.

These are steps in the right direction because sustainability has deep-reaching economic, social, and environmental implications. Indian MSMEs, given their sheer numbers, can play a big role in helping India achieve its sustainable development goals (SDGs) and inclusive and sustainable industrial development (ISID) as agreed by all countries.

However, there is presently low awareness and preparedness among Indian MSMEs for the very idea of inclusive and sustainable development, which is reflected in the lower-than-expected adoption of sustainable technologies and practices. Many Indian MSMEs are under the mistaken impression that sustainability could hurt their business interests. This is an area of concern and needs to be addressed at the earliest taking unit owners' concerns at heart.

Indian MSMEs have often been reluctant to try out new production models and methods, resorting instead to low-cost indigenous

solutions, not all of which may be aligned with the principles of sustainability. There is a strong need for nationwide programmes for familiarizing them with globally accepted ideas of efficiency, sustainability, and inclusiveness. However, it is a welcome sign that many of them are slowly beginning to become aware of their environmental responsibility.

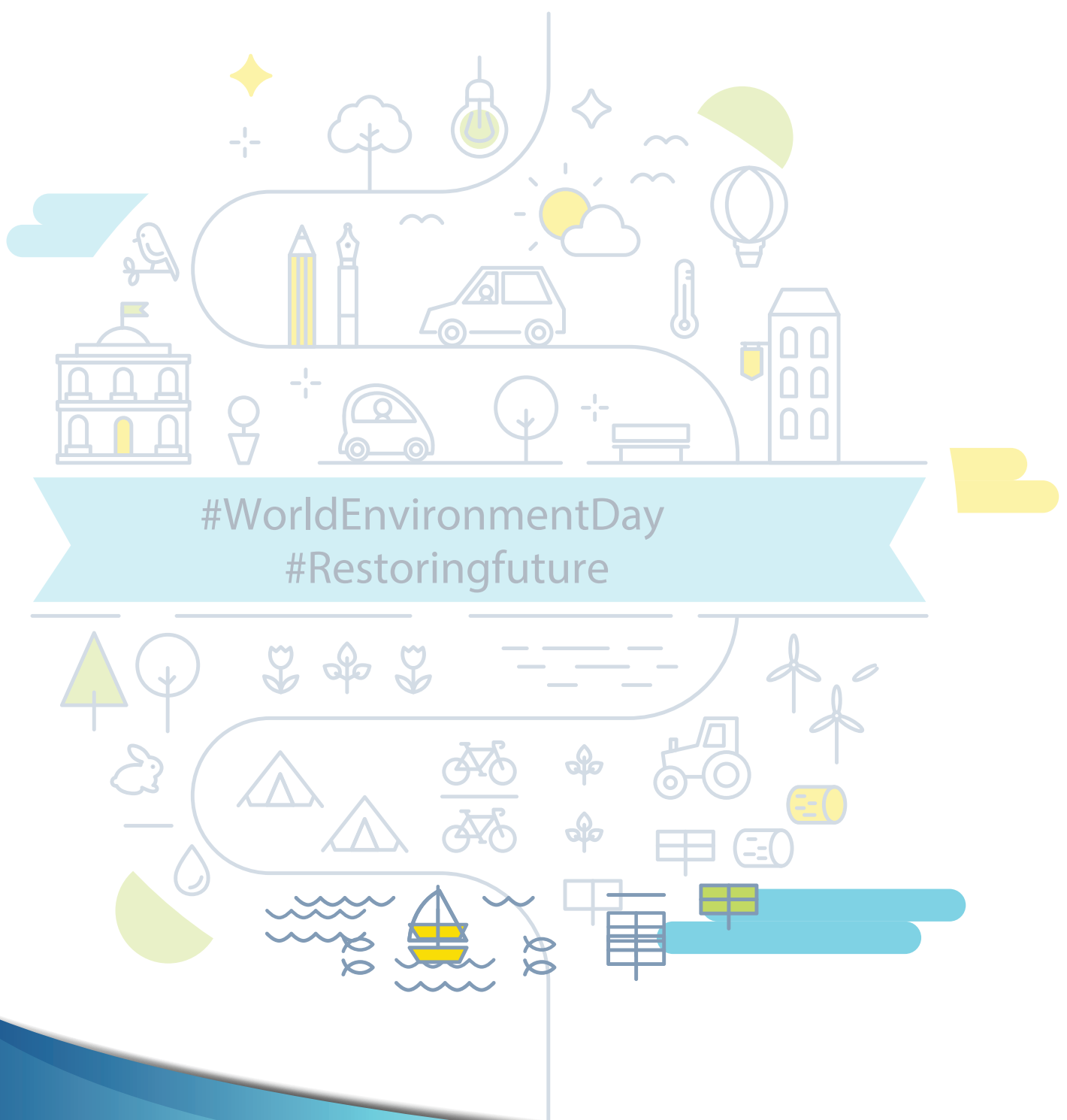
The work done by United Nations Industrial Development Organization (UNIDO) in India focuses on enhancing manufacturing for the future and promoting sustainability in various spheres of the manufacturing ecosystem.

United Nations Industrial Development Organization (UNIDO) is the specialized agency in the United Nations system that supports India with industrial development. It complements the Indian government's efforts to promote, amongst others, energy efficiency in the MSME sector. We are working with funding from the Global Environment Facility (GEF) to support energy efficiency initiatives, including audits, training and technology assessments in selected energy-intensive MSME sub-sectors.

We are working in collaboration with India's Ministry of MSMEs on market transformation for energy-efficient technologies, which aims to reduce investment risks through the standardization of energy-efficient technologies and investment costs, while easing financing by means of energy services contracting through Energy Efficiency Services Limited (EESL).

We are also working with the Department for Promotion of Industry and Internal Trade (DPIIT) to promote sustainable MSMEs in for example pulp and paper, bicycle and automotive components sectors. UNIDO interacts with local entrepreneurs, investors and industry representatives to understand the strengths and challenges in these sectors, and accordingly decide on specific areas for development.

Meanwhile, the UNIDO Global Cleantech Innovation Programme (GCIP) is fostering creativity and the formation of entrepreneurship ecosystems, allowing MSMEs to develop and commercialize their ideas, with GEF funding. We have advised the Governments of India as well as dozen other countries through this programme.





Saurabh Kumar
Executive Vice Chairperson
EESL Group

Ratcheting the Penetration of Energy & Environment Friendly Initiatives: EESL Success Story

EESL has been at the helm of driving India's energy transition for more than decade. It has seen considerable success in its endeavours, ushering in significant efficiency improvements in an array of sectors such as buildings, lighting, transportation, industry, and energy generation.

It has not only helped reduce the power demand, but touched millions of lives directly through social benefits of increased illumination and energy access, along with creating employment opportunities, triggering new manufacturing, and enabling citizens and commercial sectors to participate in energy sustainability.

Interventions such as Unnat Jyoti by Affordable LED for All (UJALA), Atal Jyoti Yojana AJAY, Smart Meters, decentralised solar and Street Lighting National Programme SLNP earlier, and new interventions such as convergence etc. have had enormous socio-economic impact and continue to shape the nation's energy trajectory. These initiatives have reduced the power exigency and carbon footprint of the nation, improved the lives of the denizens through greater illumination and have built a robust ecosystem for energy efficient technologies. EESL has also worked towards ramping up the nation's renewable energy penetration, with its decentralised solar programme in Maharashtra, Tamil Nadu and Andhra Pradesh. It launched the first convergence project in Goa recently, wherein it is integrating the delivery of clean renewable decentralized energy with energy efficient pump sets and LED lamps for rural homes. The 100MW project is

being implemented by CESL, a fully owned subsidiary of EESL. It is also spurring electric mobility adoption in the country, with an array of partnerships, with various government and private players.

The impact of these initiatives has been truly significant, with estimated monetary savings of over INR 26,469.91 Crore annually and emission reductions of over 46.5 Million t CO₂ per year. These numbers provide a clear testament to the efficacy and impact of EESL's various programmes.

EESL's efforts have garnered global awards like the prestigious South Asia Procurement Innovation Award (SAPIA) 2017, and for the innovative use of IT and business results achieved in Street Lighting National Programme (SLNP), it won CIO 100 award in 2019. The highly successful UJALA and SLNP have also bagged the Global Solid State Lighting (SSL) award of excellence for the transformational contribution to the LED sector, Award for High Impact Program for Energy Efficiency - CII National Award for Excellence in Energy Management 2020 and award of excellence at the 10th Elets knowledge exchange summit and awards 2020.

We are at a critical juncture in our climate change mitigation efforts. Energy efficiency and clean energy programmes offer us a clear pathway towards ecosystem restoration. EESL, with its myriad of innovative energy initiatives has been instrumental in propelling India's energy transition and climate action efforts.



Dr. Ashok Kumar
DDG, BEE

Promise of Energy Efficiency for Sustainability

While the world is grappling with the pandemic due to COVID 19, its capacity to face this challenge itself is pushing to its limits. The challenge of climate shift that is lurking behind, experts say is of a different order of magnitude whose trail of detrimental consequence may neither be “broken” nor “contained”. Trailers of such incidences have been witnessed all across the globe in the form of parting largest iceberg off the Antarctica, receding glaciers in Himalayas, increased spell of storms, floods etc.

As the different parts of the world has throttled usage of resources to “oil” their engines of growth without considering the fact that such indiscriminate use could exhaust the same but also put the nature to its limits. In our times, we are at the crossroads where humanity has choice to correct course to limit global temperature rise to levels that will not break the rhythms of nature. Such a choice after some years may not be available.

Recognizing this challenge, global community has come together at Paris and had historic agreement for “Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change” (Article 2.1a of Paris Agreement).

It this unmatched challenge to the sustainability of the entire human civilization, countries are getting engaged in the mitigation, adaptation and other aspects of global climate change and working collectively for arresting the rise in the temperatures to sustainable levels.

Climate Change has also emerged as one of the primary developmental challenge for India. The Indian economy is closely tied to the natural cycle such and climate-sensitive sectors such as agriculture. Slight change in climate has potential to drastically alter the distribution and quality of India’s natural resources thus affecting life and livelihoods of many of its people. In such a scenario, dealing with the threat of climate change and to enhance ecological sustainability is very critical.

Recognizing the need for sustainable development and to reduce the vulnerability towards the impacts of climate change, India has laid down several policies, plans and frameworks. Consequent to effective grounding of these, several independent reports have indicated that India is the only G20 countries currently close to 1.5°C temperature rise pathway.

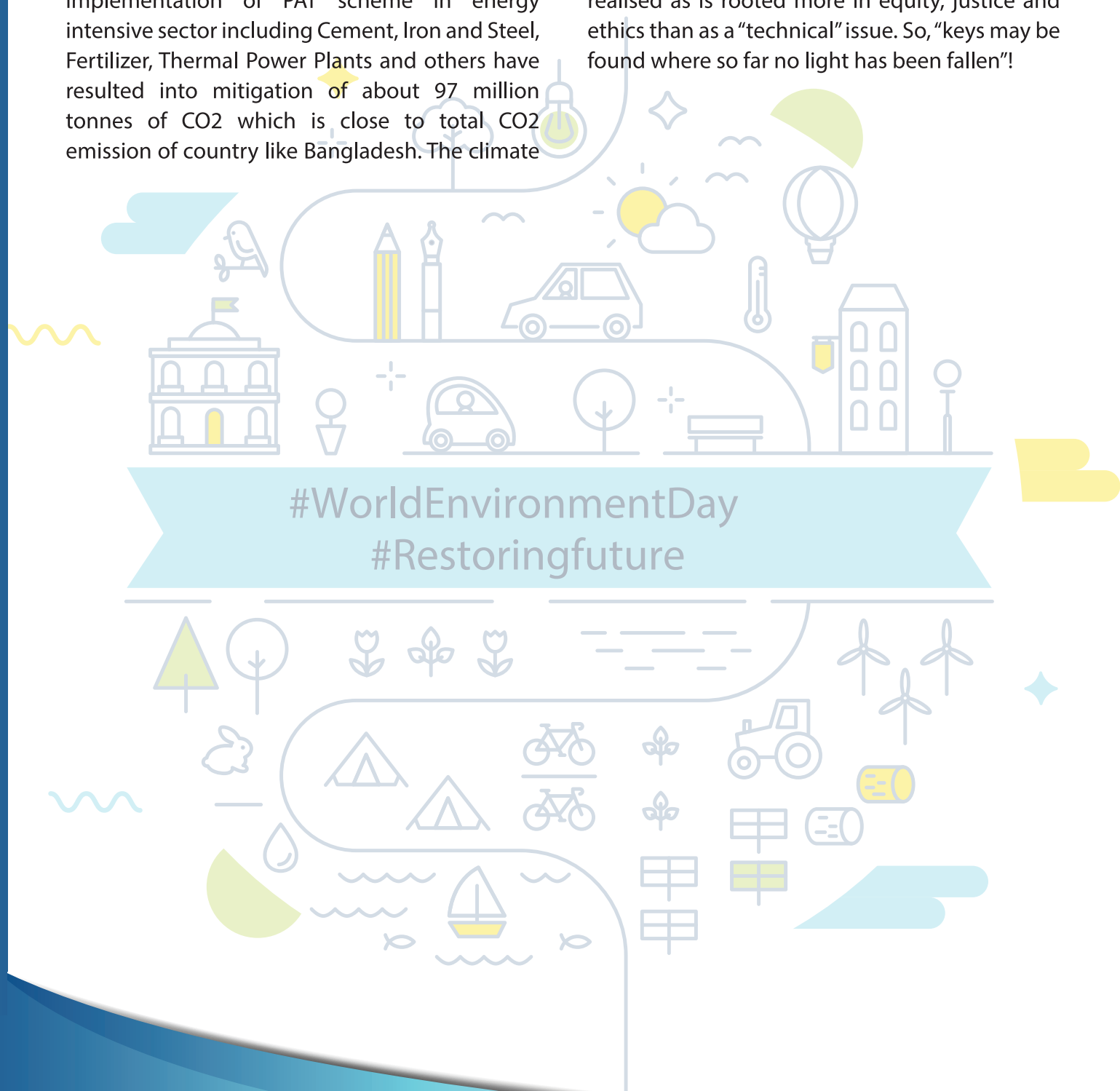
To address the climate change, efficient use of carbon intensive resources has emerged as one of the promising interventions. It is estimated that the energy efficiency measures can contribute

mitigation of about 40-50% of the emission causing global temperature rise.

To harness the promise of energy efficiency, the dedicated National Mission for Enhanced Energy Efficiency (NMEEE) included as part of National Action Plan on Climate Change (NAPCC), rolled out its flagship program viz. the Perform, Achieve and Trade (PAT) scheme a decade ago and have lived up to its promises. It is found that the implementation of PAT scheme in energy intensive sector including Cement, Iron and Steel, Fertilizer, Thermal Power Plants and others have resulted into mitigation of about 97 million tonnes of CO₂ which is close to total CO₂ emission of country like Bangladesh. The climate

dividends from other energy efficiency interventions in Buildings, Appliances, Transport etc. has further added to its promise.

In conclusion, while recognizing the promise of energy efficiency for arresting global climate shift, for a long-term sustainability coupled with growth, one must be mindful of the fact that technological solutions have limits particularly dealing with a challenge that increasingly realised as is rooted more in equity, justice and ethics than as a "technical" issue. So, "keys may be found where so far no light has been fallen"!





S P Garnaik

Executive Director (Lighting)
Energy Efficiency Services Limited

Significance of Sustainable Cooling in Protecting Our Environment

The aggregated nationwide cooling demand is projected to grow around eight times by 2037-38 from the 2017-18 baseline. Rising temperatures, population growth and urbanisation will make it rise further. This makes sustainable cooling a critical imperative.

India has been astute this and was the first nation in the world to create an integrated action plan for cooling – the exhaustive India Cooling Action Plan and seeks to make cooling greener and more energy efficient. According to India's Cooling Action Plan, the demand for space cooling in buildings will grow by 11 times between 2018 and 2038. The overarching goal of ICAP is to provide sustainable cooling and thermal comfort for all while securing environmental and socio-economic benefits for the society. This will also help in reducing both direct and indirect emissions.

By 2050, the IEA forecasts that India is likely to be the largest consumer of space cooling in the world, with space cooling becoming responsible for 28% of electricity demand and 44% of peak load. The average efficiency level of room air conditioners in the Indian market is around 3.2 ISEER (Indian Seasonal Energy Efficiency Ratio),

which is way below the current 5-Star efficiency levels of 4.5 ISEER (or more) available in the Indian room air conditioner market. Therefore, the efficiency intervention for room air conditioners presents a huge potential for electricity savings and the use of environment-friendly refrigerants.

According to a Lawrence Berkeley National Laboratory (LBNL) estimate, if India's ACs improve in average efficiency by 30% from 2015 levels, it can reduce the annual CO₂ emissions by approximately 180 million metric tons per year – this is equivalent to about 10% of India's total CO₂ emissions reductions goals stipulated in the Paris Agreement Nationally Determined Contribution (NDC). Thus energy efficiency is a viable avenue for meeting the rising demand for cooling.

There are multiple solutions that can make cooling more sustainable, with energy efficient ACs showing the most promise. The higher the efficiency of an air conditioner, the lesser energy it consumes, which translates into a reduction in power demand. A reduction in power demand leads to benefits like peak demand avoidance and reduction in emissions. Energy efficient ACs also lead to both energy and capital savings, which translate into long term affordability. Another

potential intervention is District Cooling, which essentially refers to the centralised generation of chilled water, steam or hot water and then piping that to nearby buildings for cooling purposes. District cooling is highly energy efficient as it consumes 35% and 20% less electricity as compared with traditional air-cooled air-conditioning systems. DCS can also help improve an area's climate resilience, reduce urban heat island, improve resource efficiency and circularity, retain wealth, provide alternative revenues for city governments and crucially

reduce grid stress and blackouts.

It is clear that the cooling demand is on a steep upwards trajectory. The onus is on us to meet this demand in a manner that doesn't lead to ecological degradation. Ramping up the energy efficiency of cooling systems, at both residential and institutional level can lead to considerable environmental benefits and can be a viable long term strategy to make cooling cleaner and greener.

