

INNOVATING ENERGY

A sustainable development pathway for climate action

COP26

INSIDE STORIES



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Editor's Note



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adoption of clean energy



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Secretary (Road & Building Construction Department)
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with sights on a net-zero horizon



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Managing Director (CPCL)
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Dear reader,

Our world is reeling from the adverse effects of climate change. Sustainability has now become a global imperative and has dovetailed well with the rise in climate consciousness. The world is on track for an average temperature rise of 2.7°C this century if the only steps on climate action it takes are the commitments announced till now, the United Nations Environment Programme (UNEP) has warned in a new report. This sounds out another knell for the future of our planet.

The 2021 United Nations Climate Change Conference, also known as COP26 comes at an opportune time, as the world grapples with the fallout from shifting weather patterns, caused by climate change. In this edition, themed "A sustainable development pathway for climate action", we make an attempt to trace the ways for us to usher in a green, clean and equitable future of our planet.

In the article, "Driving demand and adoption of clean energy", we discuss the pathways to large scale and rapid adoption of clean energy solutions. "A journey of transformation for the building and road construction industries with sights on a net-zero horizon" charts out the roadmap for reduction of greenhouse gas emission in construction sector particularly in buildings and road infrastructures. The article, "Energy efficient appliances, with their array of benefits will be the cornerstone of India's climate action efforts", highlights the clear need to create widespread awareness on the gamut of ecological and economic benefits offered by energy efficient appliances, in a bid to hasten their adoption by the end users. We then delve into the potential of digital technologies in hastening the decarbonisation efforts in "Cyber Physical Systems (CPS) can be the gamechanger in mitigating climate change and ushering in decarbonization." Finally, we deconstruct the various measures taken by CPCL to promote the use of renewable resources, reduce the environment emissions and improve the energy footprint in operations through the article "Towards a common action plan for Climate change mitigation and adaption – CPCL's pathways for sustainable development."

There is a myriad of avenues for achieving the desired temperature reduction and achieving the goal of a net zero future. However, for this, there has to be multilateral and multistakeholder collaboration, in the formulation, adoption and financing of clean energy initiatives, across the globe. This edition of the newsletter was aimed at encapsulating the various facets of the climate action roadmap and it is our sincere hope that it will be an engaging and thoughtful read.





Driving demand and adoption of clean energy

Bhawanjeet Singh

Executive Director
Energy Efficiency Services Limited

The Intergovernmental Panel on Climate Change (IPCC) report has reaffirmed the need for urgent and swift adoption of clean energy. It says that the world will reach 1.5 degrees C in warming by 2030, and this can be mitigated only by ushering in an era of transformative climate action. What we need now is driving large scale and rapid adoption of clean energy solutions.

Firstly, we are already witnessing a shift towards clean energy solutions such as renewable power, as is evinced by India's recent achievement of reaching a milestone 100 GW of installed renewable capacity. For clean energy solutions to realise their potential, this has to make sense from a financial standpoint too. There is also a need for ramping up investment in low-carbon technologies and innovation, which would enable India in hastening its energy transition journey and improving its renewable energy capacity. The government has already showed its commitment to scale up the use of clean energy sources and is currently undertaking a gamut of large-scale sustainable power projects, along with promoting green energy heavily through conducive policymaking.

Secondly, energy efficiency is another clean energy solution, which has become a potent tool for embarking on a sustainable development path. Industries can decrease their energy intensity and emissions considerably with the use of energy efficiency measures, which can bring about a marked reduction in global energy use and CO₂ emissions.

However, a major roadblock for accelerating the penetration of energy efficient technologies in any country is the high upfront cost. Demand aggregation is an important strategy to significantly enhance volumes, improve economies of scale and reduce the upfront cost in the process. Bundling demand allows for bulk procurement in public sector institutions and markets, which hold significant potential for improved energy efficiency and represents a large and important market in all countries. There has been a myriad of innovative implementation mechanisms, financing structures and associated institutional frameworks and delivery models that have addressed the barriers in demand side energy efficiency markets. Many of these have been adapted and implemented across the world. Public-private partnerships have considerable potential in making this vision a reality. Models such as Build – Own – Operate – Transfer (BOOT) and Pay – As – You – Save (PAYS), among others, help bring down steep upfront costs and make adoption of energy efficiency cost effective.

Another key imperative is the decarbonisation of the transport sector. It has also emerged as the top priority for the government. It intends to ramp up the EV sales penetration to 30 per cent for private cars, 70 per cent for commercial vehicles and 80 per cent for two and three-wheelers by 2030. According to Union Minister for Road Transport, Shri Nitin Gadkari, if EVs penetration reaches 40 per cent in the two-wheelers and cars segment and close to 100 per cent for buses by 2030, India would be able to reduce crude oil consumption by 156 million tonne worth Rs 3.5 lakh crore.

We have already witnessed a positive shift, as EV sales have surged. In the first half of FY22, EV sales have more than tripled to 1.18 lakh units. Until September, the sale of electric two- wheeler sales stood at 58,264 units and three-wheelers at 59,808 units, according to Centre for Energy Finance at Council on Energy, Environment and Water at Centre for Energy Finance (CEEW-CEF). In fact, India has already sold 1.18 lakh EVs, which is 90% of the total sales last FY, sharply underpinning the rapid rise in the proliferation of EVs. This uptick has been driven by factors such as outreach by manufacturers, improved charging infrastructure, price parity with conventional vehicles and plummeting battery prices.



EV sales have posted a growth across most states, this year propelled by stronger incentives and policies and the deployment of charging infrastructure. However, we are still at the fledgling state of the EV journey, as EV sales, which stand at 121,900 this financial year - account for only 1.66% of India's 20 million automobile sales, according to Council on Energy, Environment and Water (CEEW).

The silver lining here is that the two and three-wheeler segment however has grown steadily accounting for nearly half the sales in both categories this financial year. Another tailwind has been the PLI Scheme for auto industry with a budgetary outlay of Rs 26,058 crore. The new PLI Scheme, along with the already launched PLI scheme for Advanced Chemistry Cell and FAME will be a catalyst in helping the nation leapfrog traditional fossil fuel-based automobile transportation system to environmentally cleaner, sustainable, advanced and more efficient EV based system.

The priority now is the swift implementation and an increased adoption of eco-friendly and energy efficient alternatives, and increased collaboration in the sector, to roll out targeted and impactful clean energy initiatives.

<https://www.livemint.com/auto-news/govt-wants-ev-sales-penetration-of-30-for-private-cars-by-2030-gadkari-11633684847246.html>

<https://economictimes.indiatimes.com/industry/renewables/electric-vehicle-sales-more-than-triple-in-h1-of-fy22/articleshow/86897883.cms?from=mdr>

<https://www.bbc.com/news/world-asia-india-58977080>





A journey of transformation for the building and road construction industries with sights on a net-zero horizon

Sunil Kumar, IAS

Secretary (Road & Building Construction Department)
Government of Jharkhand

Climate change, exacerbated by greenhouse gas emissions, is one of the gravest issues faced by the human race today. Several international organizations, agencies and alliances have identified climate action as a top priority for all nations and highlighted the need to shift towards a low-carbon or a net-zero economy. Countries who participated in the Paris Agreement of 2015, and even some of those who did not, are working towards bringing down their respective emissions with a view to limit the global average temperature rise to below 1.5°C at best and below 2°C at worst, as compared to pre-industrial levels.

Reduction of greenhouse gas emission in construction sector particularly in buildings and road infrastructures has gained currency in achieving the objective of net zero emission goal.

The need for energy-efficient, net-zero energy buildings

According to data published by the Ministry of Statistics, Planning and Implementation in 2016, residential and commercial structures accounted for nearly a third of the total electricity consumption in India. Although, urbanization in India is still hovering over 34%, it is expected to increase with tremendous rate considering the growth rate of economy. As our cities grow, the demand for energy by buildings will correspondingly increase. NITI Aayog estimates an 800 percent increase in energy demand for India's buildings by the year 2047 as compared to 2012. Going by current trends, the country faces the prospect of high energy costs and worsening air pollution in coming decades unless appropriate measures are taken immediately. For starters, we need better building efficiency policies and programs commensurate with innovations happening around the world. Moreover, with energy conservation and carbon reduction being key priorities, it is in the collective interest of all to encourage net-zero energy buildings.

Net-zero energy buildings have very high performance. They reduce energy demand by incorporating energy-efficient technologies and using renewable energy to meet incremental energy needs. This usually entails a combination of closely integrated technologies such as renewable energy sources, heat pumps, high efficiency windows and insulation, solar panels, and wind power. As a result, these buildings have net-zero energy consumption, wherein the total energy used by the building on an annualized basis is equal to the amount of renewable energy created on-site or at a nearby location. Net-zero energy buildings not only conserve energy but also help us preserve the environment for future generations.

Provisions have been made to incorporate suitable design architectures and implementation techniques to reduce the consumption of demand of energy during and post construction period. Energy efficiency ensured by use of energy efficient electrical appliances and compulsory installation of solar power system and wind energy optimization by incorporation of suitable design at designing stage itself will certainly going to change the whole energy landscape.

Water is a precious and scarce resource. Ensuring efficient utilization of water through rain water harvesting structures, waste water treatment and its reuses has become an imperative to mitigate the environmental effects caused by inefficient uses. In building and construction sectors, several effective measures have been adopted and implemented through various government orders.

The mantra of reuse, reduce and recycle before, during and after construction activities is essential for minimizing waste generation and conservation of energy. Indoor air pollution must be tackled with design architecture and proper ventilations facilities, adoption of natural wind direction, sewerage treatment plant and reduction in waste generation. Site selection with minimizing the damage done to the local environment and avoiding cutting of trees should be promoted with appropriate rules and direction. Use of fly ash and aerated bricks reduce overall weight of the buildings for incorporation of efficient design elements. This helps in saving on the construction materials, thereby reducing the carbon footprint in construction landscape.

Net-zero in the context of road construction

Various estimates indicate that the construction sector accounts for a fourth of global carbon dioxide emissions. Roads and roadside structures have lower operating emissions as compared to buildings. However, the carbon embodied in various



construction processes adds significantly to the transportation sector's carbon footprint. This includes greenhouse gas emissions throughout the supply chain – right from the extraction of each material from the ground to its transportation, refining, processing, use, recycling and disposal.

Lifecycle analysis tools can be used to determine the environmental footprint of road construction projects. Greenhouse gas emissions over a project's lifecycle can be substantially reduced by using materials that are sustainably produced; ensuring efficient use of materials; minimizing transportation by using locally produced materials; materials that require less maintenance, repair, and refurbishment and those that can be reused or recycled instead of being disposed in landfills. The incremental cost this kind of analysis involves will be insignificant compared to the benefits it will yield. The approach to net-zero should encourage tough decisions in the present to achieve long-term benefits in the future. Although, cost-benefit analysis will further be required to convince the policy makers to adopt the net-zero emission as cost increase may vary from 10% to 170% of original project cost.

Aiming to reduce rolling resistance by using climate asphalt could be a positive step in this direction as about 25% of energy use is required to overcome rolling resistance by a car, although that must be technologically vetted in consideration with required skid resistance in wet season and climatic condition.

Resource efficiency and carbon neutrality must be placed at the center stage for sustainable road projects. Construction materials and lighting & signals have the greatest environmental impact in road infrastructure projects and these two strategic areas should be considered for harnessing the low hanging fruits.

Transportation of aggregate material for road subbase constitute a significant part of the total greenhouse gas emission which can be reduced by minimizing the distance travelled and optimum utilization of locally available resources or recycled or repurposed waste materials. Effective decision making in design phase can result in enormous saving of energy over the life of a road.

Ministry of Road Transport and Highways, Government of India has issued direction to all construction agencies to use fly ash, fly ash bricks and blocks in the construction of road within a radius of 300 kilometers of any coal/lignite based thermal power plant. Jharkhand, having numerous power plants spatially distributed across its length and breadth, is ensuring the compliance for achieving the twin objective of saving energy and cost in construction as well as precious land required for dumping site for fly ash.

Industrial waste products such as fly ash and blast furnace slag for bulk fill, base or subbase materials, use of plastic in bituminous mix, cement kiln dust for stabilization of base and binder of aggregate to minimize the energy requirement and effective utilization of resources have already been successfully implemented in various road projects in many places including in Jharkhand. Use of plastic waste with a ratio of 6-8% with bitumen can reduce the cost and minimize the harmful environment impact of plastic waste also.

Policy, as always, is the starting point for making headway in this direction. Although, there are no dearth of innovative ideas, India and state governments can collaborate with some of the developed countries who are going in for net-zero infrastructure design. In Sweden, for instance, infrastructure projects are required to report their embodied carbon. Monetary incentives are awarded to projects whose embodied carbon is below a specified limit. Several international studies suggest that it is possible to progressively reduce emissions from road construction over the next three decades using today's best technologies and practices. Fulfilling this potential will call for sufficient availability of sustainably produced biofuels; increased recycling of steel, asphalt and aggregates; as well as greater use of alternative binders in concrete. Government policies should incentivize and support such strategies.

The movement towards net-zero is a long and transformative journey that will certainly have its share of ups and downs, successes and lessons for the industry and for the government. It is important that we persist with our efforts and take course-corrective measures wherever necessary. The end goal is worth it.

<https://www.sciencedirect.com/science/article/pii/S1364032119308573>

<https://etapnews.transportation.org/can-highway-construction-achieve-net-zero-carbon-emissions/>

www.worldhighways.com

www.eurobitume.eu

Reducing the environmental impact of road construction, www.sbenrc.com.au





Energy efficient appliances, with their array of benefits will be the cornerstone of India's climate action efforts

S P Garnaik

Executive Director
Energy Efficiency Services Limited

We are at the precipice of India's journey to a sustainable future. The rapidly building climate consciousness among the general populace coupled with the growing market for clean energy alternatives have greatly helped India gain global recognition for its climate action. This metamorphosis, however, would not have been possible without our Hon'ble Prime Minister vision to build a cleaner, greener, and brighter India. He has remarked that for large-scale behaviour change, solutions that are innovative, affordable and powered by public participation need to be offered. People embracing LED bulbs, Give It Up Movement, increased LPG coverage and affordable transportation initiatives are some of the key initiatives highlighted by him.

EESL has been supporting the government in this objective, by ushering in significant efficiency improvements in an array of sectors – buildings, transportation, industry, or energy generation. EESL's initiatives, bespoke for the Indian ecosystem and denizens, have helped reduce India's carbon footprint, peak energy demand, and electricity bills. They have reduced the power exigency and carbon footprint of the nation, improved the lives of the denizens through greater illumination and built a robust ecosystem for energy efficient technologies. India has been focused on ramping up energy efficiency across sectors and use of energy efficient appliances has been identified as a valuable proposition. EESL's array of energy efficient appliances have been indispensable in mainstreaming energy efficiency in India and bringing the consumers into the fold of sustainability.

With the COP 26 just around the corner, the conversations around energy efficiency and emission reduction gain even more significance. Ahead of the conference, the International Energy Agency is working with the UK Government through the Super-Efficient Equipment and Appliance Deployment (SEAD) initiative, with the aim to coordinate and improve international action on product energy efficiency. The UK is also spearheading the COP26 Product Efficiency Call to Action, which seeks to double the efficiency of key global products by 2030, with a focus on four major energy-consuming products: air conditioners, refrigerators, lighting and industrial motors systems. EESL currently has bespoke initiatives focused on all of these appliances, apart from refrigerators.

For the industries as well, there is a significant potential for the deployment of energy efficient appliances. 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 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. This means that industries seek to gain a trifecta of benefits by adopting energy conservation measures – energy savings, monetary savings and meeting their carbon goals.

The Bureau of Energy Efficiency (BEE) had launched efficiency policies for residential appliances in 2006, with the aim to reduce the energy intensity of the economy. Beginning with four products with voluntary efficiency standards and consumer labels, the programme expanded its coverage to address 23 products across cooling, lighting, and industrial applications under voluntary or mandatory frameworks. In the last decade, BEE has reinforced the programme with multiple revisions to mandatory minimum energy performance standards (MEPS) that remove inefficient products from the Indian market. The imperative now is to ramp up the deployment of 5-star rated appliances (also known as super-efficient equipment). This can be achieved with the help of affordable pricing, bulk procurement or subsidy and interest-free loans to consumers, which can make them an attractive value proposition. There is also a clear need to create widespread awareness on the gamut of ecological and economic benefits offered by energy efficient appliances, in a bid to hasten their adoption by the end users

All these measures can together result in significant reduction in consumption of electricity, oil and gas, which will eventually help in reducing emissions and mitigating risks related to climate change. With the government's percipient vision and EESL's pioneering initiatives, India will continue on the path of sustainability and build a cleaner and greener tomorrow.

[<https://www.iea.org/news/appliance-standards-and-labelling-is-highly-effective-at-reducing-energy-use-new-joint-study-finds>]



Cyber Physical Systems (CPS) can be the gamechanger in mitigating climate change and ushering in decarbonisation

Manish Anand

CEO, iHUB Divyasampark, IIT Roorkee
(A Technology Innovation Hub and a Section 8 company set up by Govt. of India)

We have seen the permeation of technology into our daily lives. Emerging technologies such as Artificial intelligence have enabled a transformation, across sectors. However, is there a way to integrate Artificial Intelligence (AI) and Cyber-Physical Systems (CPS) into the climate action roadmap? The answer probably is yes, through “Intelligent Decarbonisation”.

Digital technologies and similar novel technologies, so-called cyber-physical systems (CPS) could be game changer in this effort of decarbonisation. Digitalisation of energy systems using CPS completely can revamp the normal marginal abatement cost curve (MACC) and create avenues for the transition to a low-carbon energy system. Climatic change is one of the most formidable challenge mankind has yet faced. Advanced Digital technologies such as artificial intelligence (AI), big data, machine learning or the internet of things (IoT) are receiving more and more attention as they can aid the decarbonisation process while requiring limited investments. These innovative solutions will also be markedly more scalable than the traditional solutions.

This is one of the reason the Indian government has commenced the National Mission on interdisciplinary Cyber Physical Systems (NMI-CPS) with a total outlay of 3600 crores, wherein an array of Technology Innovation Hubs is being established. Some of these hubs are already functional and can enable innovation in cyber physical domain for various applications, including climate change. These innovative new age technologies provide synergetic effects that increase efficiency of energy provision and industrial production thereby optimising economic feasibility and environmental impact.

Introducing artificial intelligence (AI) and machine learning techniques to such technology clusters will take their impact on to the next level with potentially beneficial impact on Green House Gas emissions. It is pivotal to further delve into the potential of digital technologies in hastening the decarbonisation efforts.

Emerging technologies will gain greater import after the imminent shift to renewables, we will need smart grids that can effectively manage the small and widely dispersed energy generation sources. Further, CPS and AI enabled smart grids would be able to tackle the issues of balancing between power generation and its distribution due to the intermittent nature of renewable energy sources, which can vary according to changing weather conditions.

1. Energy Environ. Sci., 2020, volume 13, page 744-771

2. MIT technology review whitepaper on “Decarbonizing industries with connectivity”



A common action plan for Climate change mitigation and adaption – CPCL’s pathways for sustainable development

Arvind Kumar

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Chennai Petroleum Corporation Limited

Climate change poses an acute threat to global development. The Paris Agreement on climate changes adopted in 2015 aims to limit global warming in this century to below 2 degrees Celsius compared to pre-industrial levels. To achieve this long-term temperature goal, countries aim to reach global peaking of greenhouse gas emissions as soon as possible, to achieve a climate neutrality by mid-century.

Climate change may alter the distribution and quality of India's natural resources and adversely affect the livelihood of its people. With an economy closely tied to its natural resource base and climate sensitive sectors such as agriculture, water and forestry, India may face a major threat because of the projected changes in climate.

At the same time, maintaining a high growth rate is essential for improving living standards of people, and make them less vulnerable to the impact of climate change. In order to achieve a development path that simultaneously advances economic and environmental objectives, we need to balance growth with sustainable initiatives.

Chennai Petroleum Corporation Limited (CPCL) is a group Company of Indian Oil Corporation Limited (IOCL). It has taken various measures to promote the use of renewable resources, reduce the environment emissions and improve the energy footprint in its operations.

Listed below are a few measures taken by CPCL towards sustainable development:

- a) A 17.6 MW wind farm is in operation in Tamil Nadu to promote Green Energy.
- b) Desalination plant of 5.8 MGD has been installed at Kattupalli.
- c) In addition, City Sewage reclamation plant has been installed at Manali refinery to minimise use of fresh water for the refinery.
- d) Eco Park project is being implemented near the Manali refinery, which will also enhance green belt coverage.
- e) Utilisation of up to 2.5 MMSCMD clean Regassified Liquid Natural Gas (RLNG) as internal fuel for replacing fuel oil & naphtha. RLNG is supplied by IOCL through a pipeline from RLNG terminal at Ennore
- f) Use of analysers (SO₂, NO_x, CO & Particulate matter) for continuous stack monitoring to closely monitor & control emissions in line with the directives of Ministry of Environment, Forest and Climate Change (MoEF&CC)
- g) Undertaking various energy conservation initiatives on a regular and sustained basis, to reduce MBN (Million British Thermal Unit per Thousand barrels per Energy Factor) and Energy Intensity Index (EII)
- h) Establishment of state-of-the-art Sulphur Recovery units, including oxygen enrichment facility as pollution control measure

CPCL will continue to strive for development and growth initiatives, while balancing the need to protect nature. By creating awareness on sustainable development, we will be able to achieve the twin objectives of growth and sustenance in a seamless and coordinated manner.

Our mission is in line with the statement made by Kofi Annan, former General Secretary of the United Nations: “Our biggest challenge in this new century is to take an idea that seems abstract – sustainable development – and turn it into a reality for all the world’s people”.



Energy trends from India & across the globe

Ahead of COP26, India faces flak, but refuses to be on backfoot

In a few days the mega climate conference at Glasgow will begin and it's not an exaggeration to say that the future of life on the planet is at stake. There won't be any superheroes to save the world, but hardnosed negotiations and diplomacy with no guarantee of an agreement. To an outsider these COPs (or Conference of Parties at the United Nation's climate change platform) tend to be insanely complex. But sifting away the layers of complexities, just where does India stand? Prime Minister Narendra Modi will be attending a G20 meeting on climate change ahead of the conference and the conference itself.

India could lose 1.8 to 3.4% of GDP by 2050 due to decline in rice and wheat yields

The G20 countries including the wealthiest like US, European countries, Australia will bear extreme impacts of climate change significantly denting their economies by 2050's a new report from the Euro-Mediterranean Center on Climate Change (CMCC) said on October 28th, 2021.

In India, declines in rice and wheat yields due to climate change could lead to economic losses between 43 and 81 billion EUR (or 1.8-3.4% of GDP) by 2050. Without any improvement in coastal protection or infrastructure, in a low emissions scenario projected asset or infrastructure losses can amount to 121.5 billion EUR by mid-century and by 157.3 billion EUR in a high emission scenario.

World is failing to make changes needed to avoid climate breakdown

Every corner of society is failing to take the "transformational change" needed to avert the most disastrous consequences of the climate crisis, with trends either too slow or in some cases even regressing, according to a major new global analysis. Across 40 different areas spanning the power sector, heavy industry, agriculture, transportation, finance and technology, not one is changing quickly enough to avoid 1.5 °C in global heating beyond pre-industrial times, a critical target of the Paris climate agreement.

World's chief scientists urge Cop26 attendees to step up low-carbon policies

Chief scientists and presidents of the national science academies of more than 20 countries including Sir Patrick Vallance have written to world leaders ahead of the Cop26 climate summit, urging them to set out policies to reduce greenhouse gas emissions sharply, to limit global heating to 1.5C. Governments must rapidly step up their policies to deploy low-carbon energy and other technologies and address emissions from the main high-carbon sectors of the economy, as well as bring forward innovative technologies, the signatories urged.

States should improve Energy Efficiency financing and budget allocation: State Energy Efficiency Index 2020

The 2020 State Energy Efficiency Index, launched by the Ministry of Power, mentions that there is no specific budget officially earmarked for State Designated Agencies (SDAs) or other designated institutional entities to support energy efficiency (EE) across various sectors in most states. The lack of a specific budget restricts the EE initiatives that these entities can undertake independently. Every SDA should develop an annual action plan on proposed EE measures with the estimated financial requirement and submit it to the state energy/power department with a request for budgetary allocation. A yearly exercise like this would enhance communication among different departments and give much-needed attention to energy efficiency across all sectors at the state level.

IEA declares solar power as the cheapest electricity in history

The International Energy Agency's World Energy Outlook 2020 has declared solar power as the "cheapest electricity in history", driven by the world's best solar power schemes and the technology becoming more affordable than coal and gas in most major countries.





Congratulations!



ENERGY EFFICIENCY SERVICES LIMITED
A JV of PSUs under the Ministry of Power

We are the Champions of
WePOWER Q1 & Q2 (2021),
South Asia Women in Power Sector Professional Network

1022

Number of Female
Beneficiaries

45

Number of Activities
Implemented



STEM
Education



Recruitment



Development



Retention

Highlights of EESL's exceptional activities for 2021 Q1& Q2:

- ★ Reached out to **365 female students** to create awareness on **STEM Education** through outreach sessions and competitions in different schools.
- ★ Provided various **professional development trainings** including leadership trainings, technical trainings and IT Hackathons for **486 female students, employees, and their families.**
- ★ Included diversity and innovation in our activities such as **World Environment Day Competition.**
- ★ Installed **Mini Science Centre in Schools**, organized teacher training programmes and held virtual and face to face working sessions for the students.