

#BringTheChange: Climate action begins with you.

CAN THIS CODE TO VISIT ONLINE MAGZINE

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Editor's Note S. Gopal Group ED (Commercial) EESL

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Editorial Team

Animesh Mishra

Karan Gupta

Jai Kumar

Pradeep Kaktwan

Fareen Choudhary

Disha Khosla

Ishita Agrawal

FOR EDITORIAL DETAILS AND ADVERTISEMENT ENQUIRIES

🔀 u_kgupta@eesl.co.in

011- 45801260



Editor's Note

S. Gopal Group ED (Commercial) EESL

Dear Reader,

There has been a rise in advocacy around climate action globally. We have seen the emergence of a myriad of climate change mitigation efforts, over the last decade. One of the clearest path towards a sustainable future is that of clean energy. A shift to renewable energy provides a low-cost, low-carbon, low-conflict avenue towards meeting the global energy needs in a sustainable manner.

The latest IPCC report clearly states that the greenhouse gas emissions are still on the rise and the current efforts to mitigate climate change need to be more ambitious and swifter, in a bid to limit the temperature rise to 1.5°C above pre-industrial levels. For this to happen, our climate change efforts need to be increasingly collaborative and intersectional. Governments, private institutions, multilateral organizations and even individuals need to work together to arrest the global rise in temperatures. Against this backdrop, this edition of our newsletter is appropriately themed "**#BringTheChange: Climate action begins with you**.' The aim here is to provide a diverse perspective from various leaders and experts in the clean energy space.

In 'Energy Conservation (Amendment) Bill 2022 will be pivotal in reducing India's fossil fuel-based energy consumption', we take a look at how the new amendment can promote the use of non-fossil source of energy and its potential in bringing a transformation by reducing the nation's dependence on fossil fuels. 'Last mile sustainability: All hands-on deck approach is needed to combat climate change' talks about a collaborative and sustained approach to clean energy interventions, spearheaded by government agencies. The article 'Making sustainable green building choices can have a positive, lasting, and wide-scale impact on the environment' makes the case for green buildings as a clear pathway for cities, communities and neighborhoods to decarbonise. And finally, with the article 'Role of ECBC on building energy consumption: India's step toward meeting climate targets' we shine the spotlight on the transformation of the building sector to the most advanced standards of building energy efficiency, and the crucial role it plays in achieving our climate targets.

The shift to a more sustainable future cannot happen in silos. A collaborative approach is now the imperative. It will not only bolster the fight against climate change, but also hasten the energy transition, and stimulate the swift achievement of global Sustainable Development Goals. It is now vital for us to move with urgency and alacrity, in a bid to stem the tide against climate change.



Energy Conservation (Amendment) Bill 2022 will be pivotal in reducing India's fossil fuel-based energy consumption

Manoj Kumar Singh (IAS)

Private Secretary to Union Minister for Power & New and Renewable Energy, Govt. of India

There has been a paradigm shift in how electricity is produced, distributed and even consumed in our country. We have been gradually moving towards a more digitalized, decentralised and most importantly, decarbonised energy system.

The foundation of these changes was laid by the **Electricity Act 2003**. The objective of the act was to introduce competition, protect consumers' interests and provide power for all. It also mandated metering and introduced strict punishments for the theft of electricity. The act was also in a way, a transformation for the sector. It encouraged competition, delicensed power generation and gave consumers the freedom to source power. It replaced the aging Electricity Act 1910, Electricity Supply Act 1948 and the Electricity Regulatory Commission Act 1998.

Over the years, we have seen several amendments in the act, once in 2003 and then again in 2007. These amendments were done to stimulate commercial growth in the sector and create increased synergies between the centre and the states. Another landmark moment for the sector is the Energy Conservation (Amendment) Bill 2022. The new amendments focuses on promotion of use of non fossil source of energy and seeks to usher a transformation by reducing the nation's dependence on fossil fuels. It will also be indispensable in helping India meet its commitments towards climate change and will become an important tool to reduce greenhouse gas emissions in India.

The Bill will markedly reduce India's fossil fuel based energy consumption by defining the minimum share of energy from non fossil sources to be consumed by various establishments. It will provide legal framework for a domestic carbon market with the objective of incentivizing actions for emission reduction leading to increased investment in clean energy and energy efficiency areas, by private sectors. The Bill also has provisions for ramping up the adoption of Renewable Energy as an alternative to fossil fuels. Furthermore, the Bill also seeks to regulate energy consumption by equipments, appliances, buildings, industries and vehicles/vessels.

Another way the Bill seeks to reshape the nation's decarbonization is by not only amending the Energy Conservation Code for buildings to provide for an 'Energy Conservation and Sustainable Building Code' but also bringing vehicles and vessels under its purview. The bill also envisages inclusion of Residential Buildings under its ambit to encourage sustainable habitat. The Act empowers the State Electricity Regulatory Commissions (SERCs) to adjudge penalties under the Act and adds that SERCs may also make regulations for discharging their functions. To make the enforcement more fruitful penalties provisions are revised and are differentiated based on implementation sectors. Further keeping onus to manufacturers and importers thus relieving retailers, dealers and consumers from undue harassment.

India as a nation, has walked the talk on issues of Energy Transition and climate goals. By achieving 40 % capacity from non-fossil sources in November 2021, we achieved one of the NDC targets committed in COP-21, nine years ahead of the target year i.e. 2030. The other NDC commitment was reducing the emission intensity of the economy by 33-35 percent of GDP by 2030 from the 2005 level. By 2019-20, the reduction in emission intensity is already estimated to be 29 % of the GDP. Again we shall achieve this NDC target years ahead of 2030 as well. That's why India has raised ambitions to reduce its emissions in COP26. According to the updated Nationally Determined Contributions (NDC), we now aim to reduce the emission intensity of its GDP by 45 percent by 2030 from 2005 levels, and source 50 percent of electricity from non-fossil sources along with reduction of carbon emission by 1 additional billion tonnes. The Energy Conservation (Amendment) Bill 2022 will play a central role in reducing the nation's carbon intensity and pave the way for a cleaner energy ecosystem in the nation.





Last mile sustainability: All hands-on deck approach is needed to combat climate change

Dr. Hanif Qureshi Director General, HAREDA

Clean energy is at the center of a global push towards sustainability. We can already witness the adverse effects of climate change across the globe and thus it clearly calls for impactful and targeted mitigation measures. India has been way ahead of the curve, in terms of its SDGs and renewable energy targets. At COP26, India outlined its clear goals for reduction of carbon intensity and achieving net zero, which underpins the government's sustained focus on sustainable development. We have also been moving steadily towards the goal of 24X7 access to clean and affordable energy for all the citizens.

India is building a robust energy sector, with the understanding that it is perhaps the first requisite for any country that is looking to prosper economically and balance the rope of ecological preservation. We are transforming the nation's energy sector by pioneering the implementation of both energy efficiency and renewable power. However, for us to achieve our climate goals, we need to adopt an all-hands-on deck approach. Industry leaders, policymakers and implementing agencies must all put their heads together for addressing some of the top priorities in facilitating cooperation, sharing knowledge and best practice experiences to help scale up implementation of sustainability initiatives at scale.

In Haryana, we have been working diligently to promote policies and programmes necessary for popularising the applications of various new and renewable energy technologies. We are creating awareness about the uses of solar, wind, biogas and biomass-based technologies among the public. We are also focusing on the proliferation of energy conservation measures for efficient use of energy. We have introduced a myriad of progressive policies and regulations in recent months, which have propelled our clean energy efforts in the state. We have also introduced a draft solar policy and solar parks policy and revision of regulations, with the aim to stimulate new investments and projects in the state's renewable energy sector, especially solar.

As part of the PM KUSUM scheme, Haryana was given a target of 15,000 off-grid solar pumps of 3-10 HP capacity, which we achieved with great enthusiasm and dedication. We are also promoting e-mobility for reducing the state's dependence on fossil fuels and mitigating climate change. HAREDA has also devised and is implementing several schemes to utilise the surplus biomass available in the state. The state government is also promoting renewables in Haryana by facilitating the installation of solar power plants through the RESCO (Renewable Energy Service Company) mode. As of now, projects of 6.5 MW capacity have been installed in RESCO mode and projects of about 2 MW are under installation. Compressed biogas plants in the state under the Sustainable Alternative Towards Affordable Transportation (SATAT) scheme of the Ministry of Petroleum and Natural Gas, Government of India is also being given a thrust, with the aim to reduce the state's dependence on imported gas and use of disposable paddy straw.

These are just some of the intervention that are being undertaken, in a bid to combat climate change. A collaborative and sustained approach to clean energy interventions, spearheaded by government agencies is the need of the hour to help India achieve its climate goals.



Making sustainable green building choices can have a positive, lasting and wide-scale impact on the environment

Mili Majumdar

Managing Director, GBCI India Senior Vice President , U.S Green Building Council

A shift towards greener infrastructure is essential for our planet. With 90% of our time spent indoors, buildings have a large impact on us. They are also amongst the largest consumers of energy, water, materials, and land, and about 40% of global emissions of Greenhouse gases are attributed to buildings. Although renewable energy system prices have drastically reduced over the years, there are still a few roadblocks in the way of its proliferation. There is a need to incentivise renewable energy adoption through smooth grid interface, net metering policies and tariff structures to make quicker progress.

The responsibility to reduce our carbon footprint lies with us because it is for our own comfort, health and well-being. The energy generated from fossil fuels contribute majorly towards climate change and pollution. There is still ample of time to act wisely, save precious resources like energy, water, and materials – and if we do that, our collective action can have considerable impact. Individual interventions such as switching to energy-efficient appliances, turning off taps when we do not need running water, using public transport or walking or cycling, reusing or re-purposing our belongings, and recycling waste to generate useful forms of energy can all have a cascading effect.

GBCI India's joint research study with Saint-Gobain Research India "Healthy Workplaces for Healthier People," deep dives into parameters such as indoor air quality, lighting, access to outdoor views, thermal comfort and acoustics that define workspace quality. The aim of the study was to understand how occupants feel about their workspace and how it impacts them. We studied 30 offices, out of which only one had all the indoor air contaminants within limits prescribed by standards. The study identified carbon dioxide (CO₂) and nitrogen dioxide (NO₂) as the most common non-compliant indoor air contaminants, followed by particulate matter (PM) and formaldehyde (CH₂O). A multitude of studies point to the evidence that indoor air pollution is a cause of increasing morbidities and mortalities, and there is a need for urgent intervention. The first step in the prevention of indoor air pollution is spreading awareness among people about the issue and the serious threat it poses to their health and wellbeing. Education also needs to be imparted on the use of alternative cleaner sources of energy to replace direct combustion of biomass fuel.

Green buildings, especially the ones that are LEED certified, are a clear pathway for cities, communities and neighborhoods to decarbonise. With the help of sustainable design, construction and operations, green buildings are reducing carbon emissions, energy wastage; conserving water; prioritizing safer materials; and lowering our exposure to toxins. Green buildings positively affect public health. Improving indoor air quality can improve productivity by reducing the effects of asthma, respiratory allergies, depression and stress. Realising the importance of green buildings, we at GBCI decided to partner with the leaders in the power industry to develop a holistic, simple and universally applicable tool to support them in developing the most reliable, scalable and resilient grid possible. This tool is PEER, or the Performance Excellence in Electricity Renewal, rating system. It has been created in collaboration with industry leaders and with the

support of key partners such as S&C Electric and the Galvin Foundation. PEER can drive rapid market transformation by bringing together the stakeholders involved in electricity infrastructure and development projects. PEER is being used to strengthen power systems in universities, hospitals, transit systems and even entire cities.

With interventions such as LEED and PEER, we can facilitate the construction of green infrastructure that can help us in reducing global emissions, making our communities more resilient, improving safety and security, creating thousands of new green jobs and catalysing economic growth at all levels.





Role of ECBC on building energy consumption: India's step towards meeting climate targets

Saurabh Diddi Director, Bureau of Energy Efficiency

Electricity consumption is a key ingredient to accelerate the economic growth and is one of the important indices that are considered vital for the nation's overall development. India is home to billions of people living in various climatic zones. Providing reliable and quality power supply to them in an efficient manner is an immediate need. Owning to the increase in power consumption, changes in lifestyle and consumption pattern, there is a consistent growth in electricity demand. However, our efforts are focused on reducing our carbon footprints without compromising on growth.

Improving energy efficiency meets the objective of promoting sustainable development, making the economy competitive and reducing the emission intensity of our economy. India has committed to reduce emissions intensity of the national GDP by 33% to 35% by 2030 from 2005 level. In a further demonstration of India's strong thrust on climate action, the Hon'ble Prime Minister of India announced even more ambitious targets for India based on five nectar elements – Panchamrit, at the COP 26 in November 2021. These include:

- i. Attaining 500 GW non-fossil energy capacity by 2030
- ii. 50 per cent energy mix comprising renewable energy by 2030
- iii. Reducing total projected carbon emissions by one billion tonnes from now onwards till 2030
- iv. Reducing the carbon intensity of its economy by less than 45 per cent by 2030
- v. Achieving Net Zero by 2070

Transformation of the building sector to the most advanced standards of building energy efficiency like near zero energy buildings is crucial for achieving these targets.

In India, the Energy Conservation Act, 2001 provides the basic framework for regulating all initiatives relating to the efficient use of energy and this includes Energy Conservation Building code (ECBC). Building energy codes have been adopted as a regulatory measure for ushering energy efficiency in the building sector.

ECBC was launched by Ministry of Power (MoP), Government of India, in May 2007, as the first step towards promoting energy efficiency in the commercial building sector. The Energy Conservation Building Code (ECBC) sets minimum energy standards for new commercial buildings having a connected load of 100 kW or more, or contract demand of 120 kVA or more. The effective implementation of code provides comfort to occupants by adopting passive design strategies and day light Integration. It is technologically neutral, promotes renewable energy and also emphasizes on life cycle cost of building. The updated code was launched in 2017, which had additional priorities of renewable energy integration, ease of compliance, inclusion of passive building design strategies and, flexibility for the designers.

One of the major updates to the code is inclusion of incremental, voluntary energy efficiency performance levels. There are three levels of energy performance standards in the Energy Conservation Building Code (ECBC) i.e., ECBC, ECBC Plus, Super ECBC. In ascending order of efficiency, ECBC compliant building has approx. 25% savings, ECBC+ building approx. 35% savings and compliance with Super ECBC building will show energy savings by 50% or more, as compared to conventional building.

The major components of the building which are being addressed through the code are: envelope (walls, roofs, windows), lighting systems, HVAC systems, water heating, water pumping and electrical power system.

There are many different types of commercial buildings that fall under the purview of the Code. These buildings are different from each other in basic typology, usage of spaces and occupancy. Hence, the Code has requirements for different kind of buildings broadly based on building classification in the National Building Code of India. Spatial layouts, material specifications, facade characteristics, and occupancy patterns have an impact on energy efficiency of a building and differ for these typologies.

Building energy codes are hinged on climate responsive buildings that use local natural resources and climatic conditions to their advantage. ECBC 2017 supports many of objectives of the Government of India for achieving energy security, economic growth and environmental sustainability. As a primary policy driver for guiding building construction, it is a forward-looking code and will push the building sector towards near zero energy targets. The Government of India's Smart Cities Mission, India Cooling action plan are linked with sustainable urban infrastructure development with focus on efficient use of energy in buildings.

India is in a massive construction phase and incorporation of energy efficiency norms can act as a transformative tool for GHG abatement by the efficient built stock. The building sector in India is experiencing an unprecedented growth. It has 38% (~208mtoe) of the India's total primary annual energy consumption and 31% (296 TWh) of the total annual electricity consumption with residential and commercial sector having 23% and 8% of total electricity consumption respectively. Buildings also represent a dominant share of India's overall cooling demand. "The commercial sector floor area in 2017-18 is estimated to be 1160 million m2 and is expected to grow 1.6x in the next decade to 1880 million m2, and 2.7 times the size of 2017-18 to 3090 million m2 by 2037-38. The percent air-conditioned area is expected to increase from approximately 26% in 2017-18 to 43% in 2027-28 and around 54% by 2037-38". (AEE report: Building Stock Modelling)

Under national missions like Housing for All, Smart Cities & Solar Cities, India is witnessing significant increase in commercial and residential building stock with lock-in period ranging from 30-50 years. The national missions and codes aligned to building energy efficiently and sustainably such as National Mission on Sustainable Habitat (NMSH), National Mission on Enhanced Energy Efficiency (NMEEE) now renamed Roadmap Of Sustainable And Holistic Approach To National Energy Efficiency (ROSHANEE), Energy Conservation Building Code (ECBC – both for commercial and residential) focus on building design and construction practices but require to upscale implementation to fully realise their potential. The upcoming construction presents a unique opportunity to leapfrog into low carbon and resource-efficient future by building it responsibly. Incorporating energy efficient design and construction strategies, buildings can inherently have a reduced energy consumption footprint over its operating lifetime. Existing examples of high-performance buildings in India show that on an average the annual energy consumption of such buildings could reduce by 30-40%. Further deployment of energy efficient appliances can significantly transform the energy consumption trajectory.

"The risks of climate change are the strongest negative externalities that affect India and other countries. As Hon'ble Prime Minister said at the COP26 summit in Glasgow last November, "What is needed today is mindful and deliberate utilisation, instead of mindless and destructive consumption." The low carbon development strategy as enunciated in the 'Panchamrit' is an important reflection of our government's strong commitment towards sustainable development.

Top energy trends from India & across the globe

Climate Change May Impact India's Renewable Energy Potential, Says Study

India's solar and wind potential are likely to face a negative trend in the future due to climate change, according to a new study titled 'Analysis of future wind and solar potential over India using climate models' by Pune-based Indian Institute of Tropical Meteorology. The researchers used state-of-the-art climate models devised by the Intergovernmental Panel on Climate Change (IPCC) to analyse the wind and solar projections for the renewable energy sector over the Indian subcontinent. The seasonal and annual wind speed is likely to decrease over North India and increase along South India. The southern coast of Odisha and the southern Indian states of Andhra Pradesh and Tamil Nadu show promising potential for wind energy in the climate change scenario. Regional analysis of wind potential indicates that the frequency of high energy producing wind speeds will decrease, whereas low energy producing wind speeds are likely to increase in the future.

India can add 23.7 GW of clean energy by 2026: Report

According to a report titled "Renewing wind growth to power the energy transition: India Wind Energy Market Outlook 2026", India can add another 23.7 GW of additional wind energy capacity within the next five years - with a supportive policy framework. Wind energy constitutes for majority of the renewable energy mix in India, with 37.7% of cumulative installed capacity as of March 2022. However, the overall estimated potential dwarfs the current installed capacity, the report said. There is more than 600GW of onshore capacity and an additional 174GW of fixed-bottom and floating offshore wind potential. These statistics demonstrate that there is a huge untapped wind energy potential that will be crucial for advancing the country's clean energy transition.

Coal crisis, supply crunch hastens metal makers' switch to renewable energy

India's metal producers are speeding up their transition to renewable power after a coal crisis led to a supply crunch and sky-high prices of the fossil fuel. Greenko, one of India's largest renewable energy companies, signed an agreement earlier this month with Hindalco Industries Ltd. to provide carbon-free electricity to the aluminum producer's Odisha smelter for 25 years, following a similar deal with ArcelorMittal Nippon Steel India Ltd. Greenko expects to benefit as India's renewable market opens up due to rapid industrial decarbonization. To spur industrial carbon reduction efforts, India's power ministry has changed rules to allow large power consumers to buy green electricity directly from a supplier of their choice without having to pay heavy charges to the state distribution utilities.

The US is planting a billion trees to fight climate change

Summer wildfires continue to send shockwaves through the global community. In June, parts of Europe, North America, the Middle East, and North Africa were affected by large-scale blazes, resulting from multiple heatwaves. In the fight against climate change, trees are a vital tool, as they have the ability to capture carbon from the atmosphere and store it for generations. Researchers in the United States and Colombia found the biophysical properties of trees can increase the cooling effect of forests by almost 0.5°C. As a solution to global warming, tree planting has the potential to be "overwhelmingly more powerful than all of the other climate change solutions proposed", according to climate scientist and professor Tom Crowther, from Swiss university ETH Zürich.

Commission adopts first list of renewable energy cross-border projects

The European Commission has established the first list of renewable energy cross-border (CB RES) projects under the Connecting Europe Facility (CEF). The list marks the start of the implementation of the window of the CEF Programme, dedicated to renewable energy and decarbonization. These projects aim to promote cross-border cooperation between EU countries (and between EU countries and non-EU countries) in the field of planning, development, and cost-effective exploitation of renewable energy sources. In addition, CB RES projects may facilitate RES integration through energy storage or hydrogen production facilities with the aim of contributing to the EU's long-term decarbonization strategy.





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> Phone: 011-45801260 Website: www.eeslindia.org



@EESL_India



