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## Embracing Energy Efficiency in India



Special Feature

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10th Edition of  
International Conference on  
Switchgear & Controlgears

**Highlight :** Price Variation Clause – Safeguarding both Buyers' and Sellers' interest

**Expert Speak :** Why we need to champion gender equality - Global perspective

**In Depth :** 3P's Diagnostics of Switchgear using AI and Machine learning

**Tech Space :** The Evolution of Neutral (System) Grounding Methods

  
**COVID-19  
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to fix energy consumption norms for the buildings with higher loads. The Builders must be asked to construct building adhering to prescribed energy norms fixed under Energy conservation building codes. Also, ESCO can be brought in for existing buildings who can assure the Energy savings by various options available through performance contracting. If the minimum energy efficiency standards for design and constructions of building can be made compulsory to enhance the efficiency, this will bring down the load on the electrical network and will provide significant benefits in energy savings and Demand side management. In this light, a regulatory instrument like ECBC codes introduced by the policy makers for Buildings will play a vital role in efficient use of energy in all sectors of building construction.

### Your views on Energy efficiency in industry and the role of technology.

Energy constitutes 70 to 75% of energy use in the Industries, the energy intensive industries like Aluminum, Fertilizers, Sugar, Cement, Chemical, Paper & Pulp, Iron & Steel, thermal Power Stations, Railways, DISCOMS require a large amount of energy for their daily operations. These highly energy consuming Industries have direct impact on the energy intensity of India. Therefore, it is compulsory for Industries to make systematic approach to reduce losses in order to achieve and maintain energy procurement and its utilization.

There are various technologies that can be used to monitor, measure and control energy consumption in Industries, One of them is the Smart metering based Energy monitoring system that can help in quantifying the energy losses at various levels and estimating the energy conservation potential in the manufacturing industries. The Smart metering system will allow two way communications at various points in the load centers of the distribution system and provide online information in real time basis to the Plant manager so that He/she can identify the areas of high losses and corrective action required. The online monitoring system will give facility of recording, analyzing, comparing setting targets, reporting, controlling and eliminating the waste by taking the necessary action against the problem.

The Smart metering based monitoring system will have inbuilt feature for Benchmarking the energy consumption patterns of various manufacturing units. The metering system can provide specific energy consumption reports related to various section of Industries . For example, the system can generate KWH/MT Clinker for cement plants, Kwh/Kg yarn produced in textile mills, Kcal/Kg for paper produced, Kcal/Kwh for power produced in the thermal Power Plant. Also different Statistical methods such as Norm Chart, Deviance Chart, regression analysis and related tools can be used in Industries to know how the energy is consumed in Industries in a particular way. This can

help industries to establish the baseline and set target for energy consumption.

### What are some of the untapped opportunities in the energy efficiency market?

There could be several answers to this, but suggest the following:

**Waste Heat Recovery especially low temperature waste heat recovery is still untapped to a very big extent.**

**Solar Thermal generation.**

**Adoption of latest technologies like Fuel Cells, Trigereneration.**

**IOT, digitization, Artificial Intelligence etc etc. and many more actually.**



### Hitesh Mundhada

Vice President- South Asia, CTC Global

### Why should we invest in energy efficiency?

IEA says, "Energy efficiency is the 'first fuel' as it still represents the cleanest and, in most cases, the cheapest way to meet our energy needs." This is the simplest reason why we need to invest in energy efficiency and not just on the end-use side but on the supply side delivery as well.

Power generation is one of the single largest contributors of greenhouse gas emissions responsible for climate change. COP26 reaffirmed the need for net zero carbon emission by 2050 to reduce the devastating impact of an increase of global temperature on the planet and its liveability. This will require an elimination of coal and fossil fuels for electric production and transportation.

Furthermore, the global community also needs to look reducing the losses in the transmission and distribution system which leads to nearly 1 billion metric tons of CO2 emissions worldwide. An inefficient transmission and distribution system requires more generation

which produces more emissions. Electric Grid projects are costly and long-lasting; continuing to operate for decades. During the design phase every grid project should evaluate the opportunity to increase efficiency. A missed opportunity to improve the project efficiency robs Electricity consumers of lower costs and Society of lower emissions for half of the century. Regulators and policy makers should direct that every electric grid project will make design changes that improve the efficiency of the grid to push for a robust and sustainable future.

### What are the links between energy and sustainable development?

Energy is at the heart of key sustainable development goals from expanding access to electricity, to clean cooking, from reducing fossil fuel subsidies to curbing deadly air pollution. In order to flourish in a global economy, access to affordable and reliable electric energy is of profound need. Electricity is used to pump water, to grow crops, to manufacture products and to provide energy to homes, businesses, and industry.

In the pathway to net zero emissions by 2050, energy efficiency is the first step countries can take for mitigating the impacts of climate change and which could also bring down energy bills and meet the underserved demand.

According to the data released by the Ministry of Power, India's per capita consumption of electricity is 1208 kWh (as of 2019-20) which is barely one-third of the global average. India needs to increase its per capita electricity consumption to increase its per capita GDP. We expect this to drive huge investments in T&D infrastructure across India.

### Do energy prices have an impact on energy efficiency?

Absolutely. It is far less expensive to save electricity than it is to produce it. When the price of electricity is high, many people try a bit harder to reduce their consumption to help lower their electric bills. Others will tend to use electricity during 'non-peak' hours when some utilities reduce the cost. Generally, higher the cost of energy, faster the payback for efficiency investments. More efficiency investment would be cost-effective with higher energy costs.

We could use a metaphor here. Does the price of gasoline affect the use of Internal Combustion Vehicles (ICVs)? The answer is yes. We've seen the rise of EVs not only in response to environmental concerns but also as it relates to the price of fuel. Gasoline is \$5.00/gallon of fuel in California which is by far the highest price per gallon in the US. Not coincidentally California also has the highest number of EVs on the road today. Because cars (as a category) are the ubiquitous mode

of transportation, we can't say there is a significant reduction in the use of cars. Around the edges you will see the use of that mode decrease through upticks in public transport, rail, bicycles and other alternatives.

It's similar with electricity. How do you stop using it? You can't. We still need light, refrigeration and the internet. But you can use LED lights instead of fluorescent and incandescent. You can install timers and motion detectors to reduce illumination times. You can purchase more energy efficient appliances. But you can't eliminate the use, or even drastically reduce usage, just because the price of electricity went up.

### What are some of the untapped opportunities in the energy efficiency market?

As per India's National Ujala Dashboard, about 367 million LEDs have been distributed resulting in 47,775 million kwh saving in energy per year. This has helped India avoid building over 9,500 megawatts of new generation capacity (mainly from coal) which would have cost more than \$10 billion. There are several such initiatives on the demand side. On supply side actions are also being taken to ensure clean energy generation. At COP26 India committed that 50% of its energy mix would be from clean sources by 2030.

However, there's a need to identify untapped opportunities in transmission and distribution (T&D) system that carries the electricity from the generating plants to the electricity consumer. For example, the use of energy efficient advanced conductors can eliminate the need for excessive generation thereby cutting down the GHG emissions. These same advanced conductors enable rapid upgrading of overloaded powerlines by using the existing powerline structures. This "reconductoring" relieves constrained areas in the grid so that more clean energy generating sources can be interconnected which accelerates the decarbonization of the electricity grid.

One way that developing countries can monetize their efforts to reduce CO2 emissions is through the UN Climate Change Clean Development Mechanism (CDM). According to the UN Climate Change description, "The clean development mechanism (CDM) allows emission-reduction projects in developing countries to earn certified emission reduction (CER) credits, each equivalent to one tonne of CO2. These CERs can be traded and sold and used by industrialized countries to a meet a part of their emission reduction targets under the Kyoto Protocol". The CDM is one way for T&D efficiency programs to be monetised which reduces the cost of T&D system modernization for all the electricity consumers.