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Le Meridian, New Delhi

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THE BENGAL CHAMBER

Powered by Tech

Disruptive Technologies transforming Power Industry





The Bengal Chamber of Commerce and Industry, one of the country's oldest institutions of its kind dating back to 1833, has led a benchmark in Energy and Environment.

The Chamber has, over the past decade, been providing a relevant and sustainable forum towards promoting clean technology access and energy and environment management. The **annual Environment and Energy Conclave**, an international forum for Climate Change mitigation and business response, is held every **August** and is the **preferred forum for discussing environmental and climate challenges and mitigation actions.**



The Chamber has curated '**Power Think Tank**' – an Initiative to address some of the key issues, at the National as well as the Regional Levels, engaging in Policy Advocacy and other relevant value added activities facilitating the Power Sector. Some of the identified key issues are:

- **Fuel security concerns**
- **Regulatory Matters**
- **Digital transformation of Energy**
- **Issues of State Discoms**

The Chamber, after staging the most significant International Forum in Energy and Environment in Eastern India, is set to mount '**Powered by Tech**' on **2nd August, 2019** in New Delhi as the curtain raiser for the 12th Edition of Environment and Energy Conclave to held on 29th August in Kolkata.



A reliable, economically competitive and environmentally sustainable electricity system is the cornerstone of a modern society. The Fourth Industrial Revolution builds on the digital revolution and combines multiple technologies that are leading to unprecedented paradigm shifts in the economy, business, society, and for individuals. It involves the transformation of entire systems. The electricity landscape is a prime example of the Fourth Industrial Revolution as it undergoes transformation, becoming more complex than ever before, with rapidly evolving technologies, emerging innovative business models and shifting regulatory landscapes.

The electricity system is in the midst of a transformation, as technology and innovation disrupt traditional models from generation to beyond the meter. Three trends in particular are converging to produce game-changing disruptions: – Electrification of large sectors of the economy such as transport and heating – Decentralization, spurred by the sharp decrease in costs of distributed energy resources (DERs) like distributed storage, distributed generation, demand flexibility and energy efficiency – Digitalization of both the grid, with smart metering, smart sensors, automation and other digital network technologies, and beyond the meter, with the advent of the Internet of Things (IoT) and a surge of power-consuming connected devices

Harnessing New Technologies

AT THE EDGE OF THE ELECTRIC GRID



THREE TRENDS ARE CREATING A SMARTER
AND MORE CONNECTED ELECTRICITY SECTOR



ELECTRIFICATION

of large sectors
of the economy, such
as transport and heating



DECENTRALIZATION

spurred by decreased
costs of distributed
energy resources



DIGITALIZATION

including automation,
smart metering and
the Internet of Things

Electrification, decentralization and digitalization are converging to create a smarter and more connected electric system. However, several challenges stand between the current system and a more efficient, sustainable and distributed future.

Multiple disparate trends could forcefully reshape power systems around the world. As electricity markets transform, technologies advance, industries converge, consumption patterns change, environmental concerns increase, and “prosumers” emerge. Power companies must innovate and evolve to deal with the disruptions.

Since selected regions around the world began restructuring their traditional, vertically integrated utilities in the early 1990s by introducing competition among large-scale generators, power markets have absorbed—albeit at varying rates and scopes—new drivers of change. Among them are technological drivers such as utility-scale wind and solar, distributed generation, smart grids, energy storage, and energy efficiency. Incentives, business



models, and institutional approaches have further vastly leveraged changes, posing challenges to traditional grid planning and operational practices as well as business models both for utilities and other power companies.

The accelerating change of technology, we use commercially and personally, is dramatically increasing the global demand for electric power. As consumers, we're consuming more power at an alarming rate- from air conditioning systems, heating systems, household appliances, and all forms of home entertainment devices to cloud computing, computers, and consumer electronics. Electricity Vehicles are also adding to the use. In addition to these, industrial power requirements are always there. **Global electricity demand has been projected to nearly double from the year 2010 to 2030.**

Therefore, grid to distribute power— has to be scaled to meet peak demand. **When we look at renewable energy sources such as wind, solar, and waves, great strides have been taken, but until we find a way to store electricity for use at a later time, these will help but not be game changing. Enabling smart grids, smart homes, and smart cities will help optimizing the use of power. Promising energy storage technology will make the use for efficient.**



● **AI-assisted analytics gains greater adoption**

The hype that has been surrounding terms like artificial intelligence (AI) and advanced analytics is beginning to become a reality. Energy companies are starting to gain greater control over the data and are turning it into actionable insight to drive faster and sharper decision-making. The application of AI-assisted analytics is fairly established in areas such as predictive maintenance.

2019 is likely to see an extension of this through prescriptive analytics.

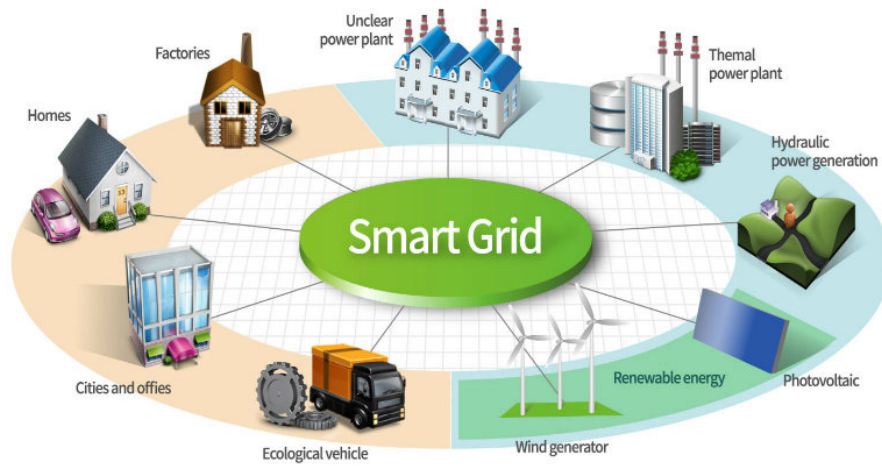
This type of analytics allows companies to move from a product-based to a process-based approach. Companies can quickly see where failures in the process are likely to occur and take remedial action before it becomes a problem. As the analytic engines become more sophisticated, the front-end business intelligence capabilities become more user-friendly. Simple interfaces, visualizations and dashboards make it easier for users at all levels to analyze the data.

Big data, elastic cloud computing, and machine learning are already being applied to solve utilities' business challenges.

● **Smart Grids to Smart Cities**

Electric utilities across the country are transitioning to a new, technological, business, and social environment largely defined by advanced information technology.

The evolution of the smart grid, right down to the device level (and the



consequent ability to transform what once was a static structure into a dynamic, information-based interactive system) means the infrastructure is in place to **perform functions in real-time**, and in a **systemic way, to achieve significant cost and energy efficiencies**. It also means that utilities are now in a position to partner with, if not lead cities to perform functions together that were not possible before the smart grid became a reality—provide clean and reliable energy, alleviation of congestion and improved transportation networks, adaptive street and area lighting, the conservation and efficient use of resources, among many others.

Smart grid technology has driven operational efficiency, dramatically improving outage response and restoration time and managing distributed and intermittent generation. That same technology platform, particularly its advanced communication and control capabilities.

Utilities and cities are becoming aware that their continued success and relevance are best served by working together toward the common goal of providing innovative, highly reliable, safe, and responsive services. Both are moving from a centralized, top-down model to a distributed, horizontal structure; their relationships with customers and constituents are becoming much more collaborative. In the process, their digitized interactions with customers will yield massive amounts of information in real-time. At the core of the challenge that both face—but particularly utilities— is how to make effective use of this data.



● Storage is the new source of Power

Storage prices are dropping much faster than anyone expected, due to the growing market for consumer electronics and demand for electric vehicles. Storage can be deployed both on the grid and at an individual consumer's home or business. **A complex technology, its economics are shaped by customer type, location, grid needs, regulations, customer load shape, rate structure, and nature of the application.** It is also uniquely flexible in its ability to stack value streams and change its dispatch to serve different needs over the course of a year or even an hour. These value streams are growing both in value and in market scale. Cheap battery storage will pose a challenge for utilities behind the meter (that is, small-scale installations located on-site, such as in a home or business). But it will also present an opportunity for those in front of the meter (large-scale installations used by utilities for a variety of on-grid applications).

Cheap solar is already proving a challenge to business as usual for utilities in some markets. But cheap storage will be even more disruptive because different combinations of storage and solar will likely be able to arbitrage any variable rate design that utilities create. Specifically, net energy metering (NEM) refers to the system that allows excess



power to be sold back to the grid at retail rates; and feed-in tariffs, which are guaranteed price adders for renewable power, have played an important role in expanding the global market for renewables.

● **Block Chain will transform Power Industry**

Blockchain, originally devised for digital currency such as bitcoin, has moved into the energy space, allowing digital information to be distributed across networks. The idea is to allow consumers, be they individuals or commercial enterprises, to buy and sell energy directly between one another, in a peer-to-peer (P2P) trading manner. **Blockchain is well-suited to this because it creates a transparent, auditable, and automated record of energy generation and consumption. It can result in energy efficiency and cost savings.**

There has been some of the use cases of blockchain technology in the energy industry, maintaining an ever-evolving list in its “energy blockchain use case repository.” Many of these use cases are pilot projects, with a number of efforts underway in Europe. There are also projects in China and Japan; in China, industrial technology developer Wanxiang Group plans a \$30 billion investment in a blockchain-backed “smart city” project. Other countries developing blockchain projects around energy include the U.S., Australia, New Zealand, and South Africa.



The Organizer: **The Bengal Chamber of Commerce and Industry**

The Bengal Chamber of Commerce and Industry, one of India's oldest institutions of its kind, traces its origins to 1833. For the last one and a half centuries and more, the Chamber has been witness to the momentous events that have shaped India's industrial and social character. Donning its multiple roles as catalyst, initiator, facilitator, business partner and service provider, the Chamber has helped Governments, both at the Federal and State levels, in crafting pioneering and significant legislations of the Nation. **The Chamber has played a leading role in the formulation of national legislations and institutions like Customs Act, 1863, Calcutta Port Trust, 1870, Indian Electricity Bill, 1902, Indian Life Assurance Act, 1910, Indian Factories Act, 1934 and many more.** The Bengal Chamber Formula on Dearness Allowance, the creation of the first arbitration body in India in 1853, the creation of the Indian Bar and modification in Indian Companies Act and Indian Insurance Act are the areas in which The Bengal Chamber has played a distinctive role and etched its place in India's economic history. These are but only a few of the path-breaking contributions in its more than 180 years of existence.



The Chamber's AGM in 2013 was graced by Shri Pranab Mukherjee, President of India which was an unprecedented occasion, in the words of the President, for Chambers of Commerce in general. The President expressed his unequivocal love for Kolkata and for the Chamber, which had influenced his decision to address, for the first time ever, the AGM of a Chamber of Commerce. Shri Mukherjee said that the Chamber had provided yeomen service to the nation for 180 years and wished for it to continue so for the next 180 years.

Today, the Chamber has over 300 members from industry, trade and commerce. The Chamber's interest and operations range from organizing mega seminars and relevant events on the 'brick and mortar' industry to the new-age 'click' organizations. From financial services, insurance, banking and taxation to focusing on the environment and energy sectors and creating an effective platform for MSMEs, the Chamber's range of operations is diverse and evolving over time.

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