

## INTERVIEW

# ELECTRIC GRID WILL SOON EVOLVE INTO AN EVEN SMARTER “GRID OF THINGS”

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The evolving grid will be a network of all smart communicable things plugged on to the grid - “grid of things” like internet is evolving as “internet of all things”, President, India Smart Grid Forum (ISGF), Mr. Reji Pillai shares in an interview with Subash Deb, Deputy Editor of Infraline Plus. Mr. Pillai, who is also the chairman of the Global Smart Grid Federation, says India’s entire smart meter roll-out could be delayed by few years, besides pointing out that supplying 24x7 quality power to all customers remains a bigger challenge in India. He also talks about ISGF’s mandate, milestones in recent years, etc.

## Q Please tell about ISGF and its mandate.

India Smart Grid Forum (ISGF) is a public private partnership initiative started by the Ministry of Power (MoP), Government of India for accelerated development of smart grid technologies in the Indian power sector. The main objectives of ISGF is to help the Indian power sector deploy smart grid technologies in an efficient, cost-effective, innovative and scalable manner by bringing together all key stakeholders and enabling technologies. We are a think-tank that creates a platform for public and private stakeholders, research

**WE HAVE BEEN ACTIVELY INVOLVED IN STANDARDS DEVELOPMENT AND ENABLING REGULATIONS FOR GRID MODERNIZATION. PRESENTLY, WE ARE ENGAGED IN PREPARING THE ENERGY STORAGE ROADMAP FOR INDIA**

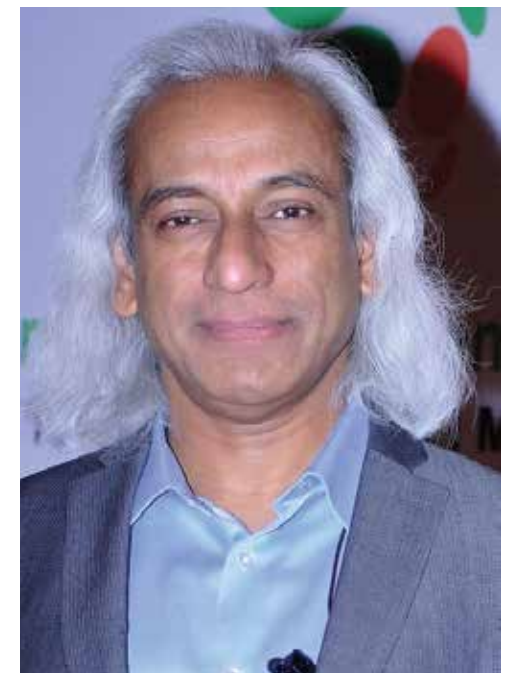
institutions and power utilities to exchange ideas and information on smart grids and develop use case scenarios for India. Mandate of ISGF is to advise government on policies and programmes for promotion of Smart Grids in India, work with national and international agencies on standards development and to help utilities, regulators and the industry in technology selection, training and capacity building.

## Q What are the milestones of ISGF in the last one year?

Among various activities including projects, whitepapers,

technical reports, advisory services, training programmes etc. over the last one year, the most important work was our study report on “Implementation Plan for Electrification of Public Transportation in Kolkata”. This report was globally appreciated and considered as a first-of-its-kind study; and its recommendations are now being implemented by the state government. The World Bank has approved a loan of US\$ 150 million for the transport sector in West Bengal and part of the money being allocated for electric vehicles and enabling infrastructure for EVs in Kolkata. We have worked with BIS and facilitated the finalization and issue of IS:17017 Part-1, the standards for electric vehicle charging infrastructure. The accompanying standards on communication protocols being issued by end of this year. We have also published a white paper on EV Charging Infrastructure Business Models for India recently. Apart from this, ISGF has been awarded contracts by SAARC Energy Center to prepare Smart Grid Roadmaps and EV Roadmaps for SAARC Countries. Based on the work, ISGF pursued with the Department of Telecom and the recommendations for free spectrum for machine to machine (M2M) communication, TRAI has allocated 7 MHz of license free spectrum for smart grid and smart city applications. Our annual event India Smart Grid Week held in March 2018 attracted over 2,000 participants from 38 countries. We conducted several workshops and training programs of which the highlight was the 5-day Smart Grid Foundation Course held in Delhi for participants from 8 ASEAN Countries which was funded through a grant from the ASEAN Secretariat. We also organized Distribution Utility Meet (DUM) for the first time in November 2017 in Bangalore which was hosted by BESCO. The objective of DUM is to bring all DISCOMs under one umbrella to discuss issues of common interest and also to learn from each other. DUM 2018 is scheduled for 01-02 November which will be hosted by

**WE ARE ALSO PREPARING PLANS AND DISCUSSIONS FOR A VERY AMBITIOUS PROJECT TO INTER-CONNECT THE REGIONAL GRIDS IN ASIA – THE ASEAN GRID, THE SAARC GRID AND THE GCC GRIDS**



Mr. Reji Pillai  
President, India Smart Grid Forum (ISGF)

Tata Power Company in Mumbai. Another significant achievement is ISGF’s MOU with Think Smartgrids, France, the smart grid association in France which was signed during the visit of President Macron to India in March 2018.

## Q Please elaborate on ISGF’s objectives, activities and future plans.

As already stated, the main objective of ISGF is to help the Indian power sector deploy smart grid technologies in an efficient, cost effective, innovative and scalable manner by bringing together all key stakeholders and enabling technologies. We have been actively involved in standards development and enabling regulations for grid modernization. Presently, we are engaged in preparing the Energy Storage Roadmap for India. This is a very comprehensive work; we are carrying out in consultation with the Central Electricity Authority (CEA) and the Ministry of New and Renewable Energy (MNRE).

The India Energy Storage Alliance (IESA) is our partner in this task. The draft roadmap will be issued by the end of this year. We have been conducting bilateral smart grid workshops with Sweden, the USA, European Commission, France and Canada. These interactions have started giving concrete results. The European Commission is likely to approve a grant for the smart grid demonstration project in Tata Power Delhi Distribution Ltd. Similarly, collaboration arrangements are under discussion between ENEDIS, the French distribution utility and BESCOM and CESC, Kolkata in India. We are also preparing plans and discussions for a very ambitious project to inter-connect the regional grids in Asia – the ASEAN Grid, the SAARC Grid and the GCC Grids. The next EU-India smart grid workshop is scheduled in November 2018 which will be hosted by Florence School of Regulations. A team of very senior policy-makers and regulators, as well as utility CEOs from India will be participating in the workshop which will focus on regulations and market design for mainstreaming renewables as well as energy storage and electric vehicles.

**Q What is ISGF’s growth strategy?**  
As a think-tank, we do not pursue aggressive growth plans. We are expanding our activities to city gas distribution and city water distribution domains. The primary driver for this initiative is to leverage the digital assets of electric utilities for water and gas distribution domains at marginal cost. For example, customers can get a combined bill for all three services, which means huge savings in the cost of operations of these utilities – particularly for gas and water utilities whose monthly bills are much less compared to electricity bills. They all can have common call centers, leverage the last mile communication infrastructure for automating their networks, share their GIS maps and applications such as outage management system etc. The block chain technology is

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gaining momentum and there are several successful use cases that are relevant in the Indian context. ISGF has made alliances with global experts working in the block chain solutions for electric utilities. We have signed MOUs with Energy Web Foundation (EWF) and Energy Blockchain Consortium (EBC). We will soon be launching an Indian chapter of EBC. We are in advanced stages of finalization on select block chain pilots in India, which will radically change the electricity markets in the country. Another area we wish to focus is on vehicle to grid integration (VGI). Electric vehicles are connected to the low voltage grid for charging; and rooftop solar is also connected to the same low voltage distribution grid. As the percentage of generation from rooftop solar increases, the power quality can be adversely affected owing to intermittency of solar generation. This can be addressed through VGI - the car batteries can smoothen the rooftop solar generation. We are also collaborating with international research teams on synthetic inertia for the grid.

**Q Can you please throw some light on the progress of Smart Grid in India, particularly post the launch of National Smart Grid Mission in March 2015?**

Smart technologies are being implemented in bits and pieces under ongoing programmes like IPDS, DDUGJY, UDAY and SAUBHAGYA. Large smart grid projects being implemented by state-owned DISCOMs are moving at slow pace. NSGM approved several projects. Chandigarh projects are in the final stages of award.

**Q What are the challenges as far as implementation of Smart Grid and Smart Metering are concerned in India?**  
The single most constraint is the capacity issue in DISCOMs as they are struggling with completion of R-APDRP, IPDS, DDUGJY, UDAY and SAUBHAGYA. DISCOMs do not have manpower to take up more projects. Another issue is the frequent changes in leadership of DISCOMs – with every change of the MD/CEO, the agenda changes. The ISGF white paper on “AMI Rollout Strategies and Business Models for India”, published in 2016, proposed smart metering as a service. In this model, a DISCOM should engage a metering services agency which will implement and maintain the smart metering system and DISCOM will pay an agreed amount per meter per month for ten years. So, no upfront capital cost or technology selection, and capacity building challenges for DISCOMs. The business model proposed by EESL is on similar lines. However, EESL is expected to face challenges in the way they are currently implementing the smart metering project with GPRS modems in each meter for communication. They are also buying meters separately and system integration separately which is not what ISGF proposed. We advocated a single point responsibility for the metering services agency. As far as DISCOMs are concerned, EESL is the metering services agency. But EESL has segregated the projects into bits and pieces to different agencies and also chosen the communication technology themselves. In our view, this is not likely to give expected results and EESL will face

**AS A THINK-TANK, WE DO NOT PURSUE AGGRESSIVE GROWTH PLANS. WE ARE EXPANDING OUR ACTIVITIES TO CITY GAS DISTRIBUTION AND CITY WATER DISTRIBUTION DOMAINS**

huge challenges in meeting the service-level agreements with DISCOMs. With several state DISCOMs signing up with EESL for smart metering and EESL pursuing a model which is very risky, the entire smart metering rollout in the country will be delayed by few years.

**Q It is expected that peak electricity demand will increase manifold by 2050 with rising electricity consumption. Smart Grids are said to have intelligent features to reduce the peak demand increases. Please enlighten us.**  
The approach towards 1.5 degree Celsius target by 2050 is to electrify almost all human activities including transport and agriculture and decarbonize the electricity sector through renewables and nuclear power. Hence, electricity consumption is likely to increase globally. Predicting 2050 is too risky – new technologies are emerging at faster pace. Efficiency of solar cells and batteries will increase radically and their prices will continue to decline making grid defection economical for a variety of customers in various geographies. Solid state batteries and solid state transformers are expected to be commercialized in the next decade or so. Nuclear fusion and singularity is also expected before 2040. So, 2050 is going to be a different world. During 1980s, who could imagine that 30 years down the line every person will have phone in his pocket connected to the internet and can communicate through voice, data and video! Flexibility and digitalization are the latest trends in smart grid technologies. Through a combination of digital technologies and smart policies enabling peer to peer (P2P) trading, smart appliances, equipment and electric vehicles will contract electricity from the cheapest resources available on the grid in real time through smart contracts executed on blockchain. Time of use pricing of electricity will help flatten the load on the grid.



**Q Why is Smart Grid touted as the energy internet of the future?**

The traditional grid was only electricity generation plant, transmission and distribution equipment and the energy meter at customer premises. What happened behind the meter was not a concern for the utility. However, with the share of intermittent distribution energy resources expanding rapidly, grid balancing is becoming a major challenge. Utilities now need to worry about Behind-the-meter equipment and activities and need to monitor and control them, which requires a two-way communication facility. The evolving grid will be a network of all smart communicable things plugged on to the grid - “grid of things” like internet is evolving as “internet of all things”. Digital technologies will be at the centre of the smart grid.

**WE HAVE ACHIEVED A HUMUNGOUS TASK OF COMPLETING VILLAGE ELECTRIFICATION. NOW SAUBHAGYA WILL PROVIDE ELECTRICITY CONNECTION TO ALL HOUSEHOLDS. HOWEVER, SUPPLYING 24X7 QUALITY POWER TO ALL CUSTOMERS IS A MUCH BIGGER CHALLENGE**

**Q The success of Power for All by 2019 is dependent on a robust T&D infrastructure, smart grid, smart meters, etc. How will you rate India's progress in this direction?**

We have achieved a humungous task of completing village electrification. Now SAUBHAGYA will provide electricity connection to all households. However, supplying 24x7 quality power to all customers is a much bigger challenge which requires upgradation of the distribution network. The proper planning for achieving 24x7 reliable supply is lacking. We do not have correct data on the number of distribution transformers and their capacities. The expected demand from customers on each feeder should be estimated and transformation capacity to be built to meet that demand. That exercise, we are yet to commence. Having generation capacity alone is no guarantee for Power for All. ➡